NOLOGY DEPT.

SEPTEMBER
1933

First Copy

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FLEET OWNER

THE FERGUSON PUBLISHING CO., 90 WEST ST., NEW YORK, N.Y.

Devoted to the Better Operation and Maintenance of Truck, Bus, Taxicab, Passenger Car and All Automotive Fleets

First Copy

THIS MONTH'S ARTICLES:

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Maintenance and Inspection Methods . . **Page 16**
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Our Experience With Governors . . . **Page 20**
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Analyze Exhaust Gas—Then What? . . **Page 24**
(A Tune-Up Story)

Do They Get Hot?—24 Reasons Why . **Page 28**
By Frank P. Illsley

Reports on Refrigerated Bodies . . . . **Page 38**
(Question-of-the-Month)

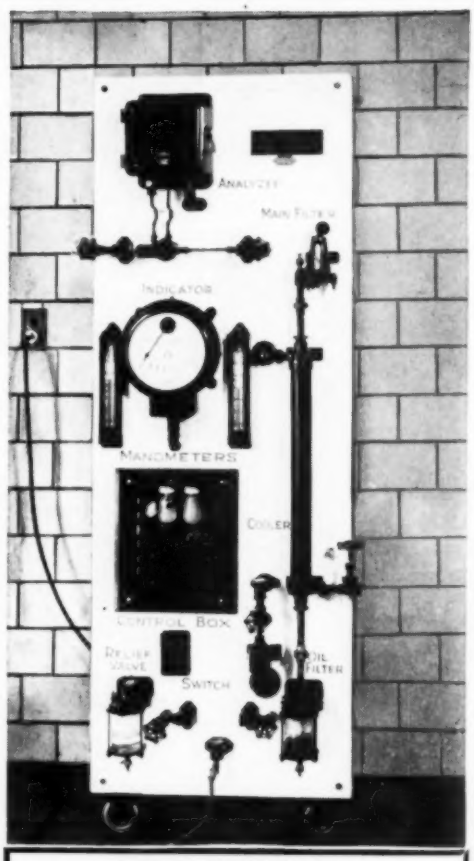
And Our Usual Departments

2500 FLEET OPERATORS

are now using *POWER PROVER* Service to cut gasolene and oil costs ... lower maintenance expense ... increase fleet efficiency

Following is a partial list of the 2500 fleet operators in all parts of the country who have made POWER PROVER Service an established part of their maintenance routine:

THE ROCKFORD BUS CO.	Rockford, Ill.
MORTOR SUPPLY CO.	Chicago
THE MAIER ROEDEL BAKING CO.	Chicago
THE WILLETT COMPANY	Chicago
LAMBRECHT CREAMERY	Chicago
FARMERS RAPID TRANSIT CO.	Chicago
DE LUXE MOTOR STAGES	Chicago
KEIG-STEVENS BAKING CO.	Rockford, Ill.
FREEPORT BAKING CO.	Freeport, Ill.
W. T. RAWLEIGH CO.	Freeport, Ill.
PETERSEN BAKING COMPANY	Cedar Rapids, Ia.
CROWN COACH COMPANY	Joplin, Mo.
TRI-STATE MOTOR TRANSPORT, Inc.	Joplin, Mo.
JUNGE BAKING COMPANY	Joplin, Mo.
UNION TRANSPORTATION CO.	Tulsa, Okla.
KRESGE DEPARTMENT STORE	Newark, N. J.
CONTINENTAL BAKING CO.,	New York, Buffalo, Washington, Cleveland
ADOLF GOBEL, Inc.	New York
REX COLE, Inc.	New York
W. C. MULLIGAN, Inc.	New York
WARD BAKING CO.	New York
THE WEBER McLOUGHLIN CO.	New York
STERRICK DELIVERY CO,	New York
YEO CONSTRUCTION COMPANY	Philadelphia, Pa.
AKRON TRANSPORTATION CO.	Akron, O.
GENERAL ELECTRIC CO.	Cleveland, O.
CANADA DRY GINGER ALE, Inc.	Boston, Mass.
NATIONAL CASKET CO.	East Cambridge, Mass.
NEW BRITAIN TRANS. CO.	New Britain, Conn.
ROGER SHERMAN TRANSFER CO.	East Hartford, Conn.



LISTED BELOW are 20 benefits these enthusiastic users report since adopting POWER PROVER Service. They are open to you and your fleet and it will cost you nothing to discover what POWER PROVER Service will do for you. On request a *free* demonstration will be made on your fleet and with your own mechanics. Write to Cities Service POWER PROVER, Room 702, 60 Wall Street, New York City, N. Y.

CITIES SERVICE OILS
ONCE - ALWAYS

Radio Concerts—Fridays at 8:00 P. M., E. D. T., over WEAF and thirty-three N. B. C. stations

NOT FOR SALE

The POWER PROVER is *not* for sale. It is a service offered to users of Cities Service petroleum products to help them get better and more economical service from their equipment

POWER PROVER Service includes three distinct features: (a) an analysis of exhaust gases; (b) a comprehensive 12-step Tuning Routine; (c) use of exclusive Cities Service tuning tools and precision instruments.

BENEFITS OF POWER PROVER SERVICE

1. Detects gasolene waste.
2. Reduces gasolene consumption.
3. Reduces motor oil consumption.
4. Improves lubrication.
5. Improves compression.
6. Minimizes carbon.
7. Helps prevent valve leakage.
8. Prolongs the useful life of vehicle.
9. Reduces the number of "stalls" or breakdowns on the road.
10. Insures more reliable service.
11. Leads the way to increased business by keeping customers satisfied.
12. Reduces the danger of carbon monoxide.
13. Improves the faculties of drivers.
14. Lowers insurance expense.
15. Helps prevent tainting of baked food products.
16. Aids public relations for fleet operators by reducing fumes.
17. Cuts engine tuning time.
18. Enables comparison and analysis of the ability of both drivers and mechanics.
19. Provides drivers and mechanics with a reliable indicator of the workmanship.
20. Indicates with certainty which vehicles need major repairs or overhauls and when.

CITIES SERVICE POWER PROVER

REDUCE TON MILE FINISHING COST

Many fleet owners are making a definite saving on ton mile costs by using Ditzco Enamel. It works two ways. There is a saving in labor and time — Ditzco goes further and can be easily and quickly applied. Then Ditzco wears longer, thus reducing the maintenance cost.

Ditzco Enamel is available in a variety of colors throughout the country. Write for Ditzco *special* trial offer to Fleet Owners.

Cost Reducing Facts about DITZCO ENAMEL

Can be applied over old finishes—stays put.

For spray or brush. Flows freely to a smooth, level surface.

Quick drying—porcelain-like gloss without polishing.

Tough, durable film, flexible on both wood and metal.

Resists salt water and chemicals.

Covers solid in one coat.

Saves time and materials.

DITZCO ENAMEL

DITZLER COLOR CO., 8000 W. Chicago Blvd., DETROIT, MICH.

Say "I saw it in FLEET OWNER"—It Helps!

55 Internationals serve the Nash-Finch Company

The Nash-Finch Company is one of the country's largest wholesale distributors of groceries, coffees, fresh fruits and vegetables. Since the first of their International Trucks was purchased, 13 years ago, their fleet has been called on for every conceivable type of urban and cross-country service. Their preference for Internationals is high tribute to the stamina of these trucks and the vast servicing organization which maintains them.

INTERNATIONAL TRUCKS

ARE SERVICED BY THE WORLD'S LARGEST COMPANY-OWNED TRUCK SERVICE ORGANIZATION

International reputation is built on Performance, Appearance, and *Service*

Wherever motor trucks may travel they are never outside the endless circle of International's company-owned servicing facilities—never far from factory-trained mechanics, standard maintenance practice, or authentic factory parts.

Internationals are never far away from the careful, responsible scrutiny of those who know them best—their own makers.

Lower than ever in first cost, today, International Trucks are equally low in their operating costs per ton-mile, due not only to the essential soundness of their construction, but to the far-flung servicing organization that safeguards them long after their purchase has been forgotten.

Whatever your business may be, or wherever your trucks may be called upon to travel—this most complete line of trucks will render you the most economical kind of all-around service.

There are now International models for every conceivable requirement in any line of business, ranging from the new ½-ton delivery truck on up to the powerful, heavy-duty models of 7½-ton capacity. Visit the International branch or dealer near you and see the justly-famous International economy demonstrated.

NASH-FINCH COMPANY
WHOLESALE DISTRIBUTORS
400 OAK GROVE
MINNEAPOLIS, MINN.

March 23, 1933

International Harvester Company
Minneapolis, Minnesota
Gentlemen:

The Nash-Finch Company operates wholesale houses in eight states and we have 55 Internationals in our fleet of trucks.

Because of our wide territory we do not operate our own service stations but use International Service for such maintenance as is required.

We are pleased with the low operating costs of all our International Trucks. As an example, we have just received a letter from one of our Branch Managers stating that one of his Internationals has been operated over 20,000 miles at exceptionally low cost and with less than $7.00 spent for repairs.

International Trucks and International treatment appeal to us.

Yours truly,
NASH-FINCH COMPANY
Secretary.

LSK:H

INTERNATIONAL HARVESTER COMPANY OF AMERICA (INCORPORATED)
606 S. Michigan Ave. Chicago, Illinois

INTERNATIONAL TRUCKS

Say "I saw it in FLEET OWNER"—It Helps!

The

FLEET OWNER

Published Monthly in the interests of Automotive Fleet Owners who maintain their own Repair and Service Shops and devoted to the better Operation and Maintenance of Truck, Trailer, Bus, Passenger Car, Taxicab and all Automotive Fleets.

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WORLD'S Largest Fleet Standardizes on Hoof Cantilever Spring Governor

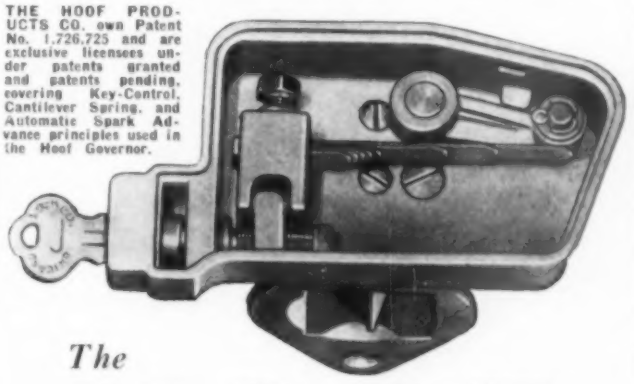
This fleet has used various makes and types of Governor equipment and after exhaustive comparative tests this Governor was selected for its simplicity in design, its dependability in service, its full power capacity, and its freedom from service calls. The generous use of Stainless Steel prevents sticking butterflys and corrosion. Other excellent materials and workmanship entering into its manufacture assures long life. 390 National Fleets, in addition to the World's largest, have adopted the Hoof Governor in 1933.

Write us regarding your requirements—we will be pleased to forward complete description, prices, etc.

HOOF PRODUCTS CO.

166 N. FRANKLIN ST. CHICAGO

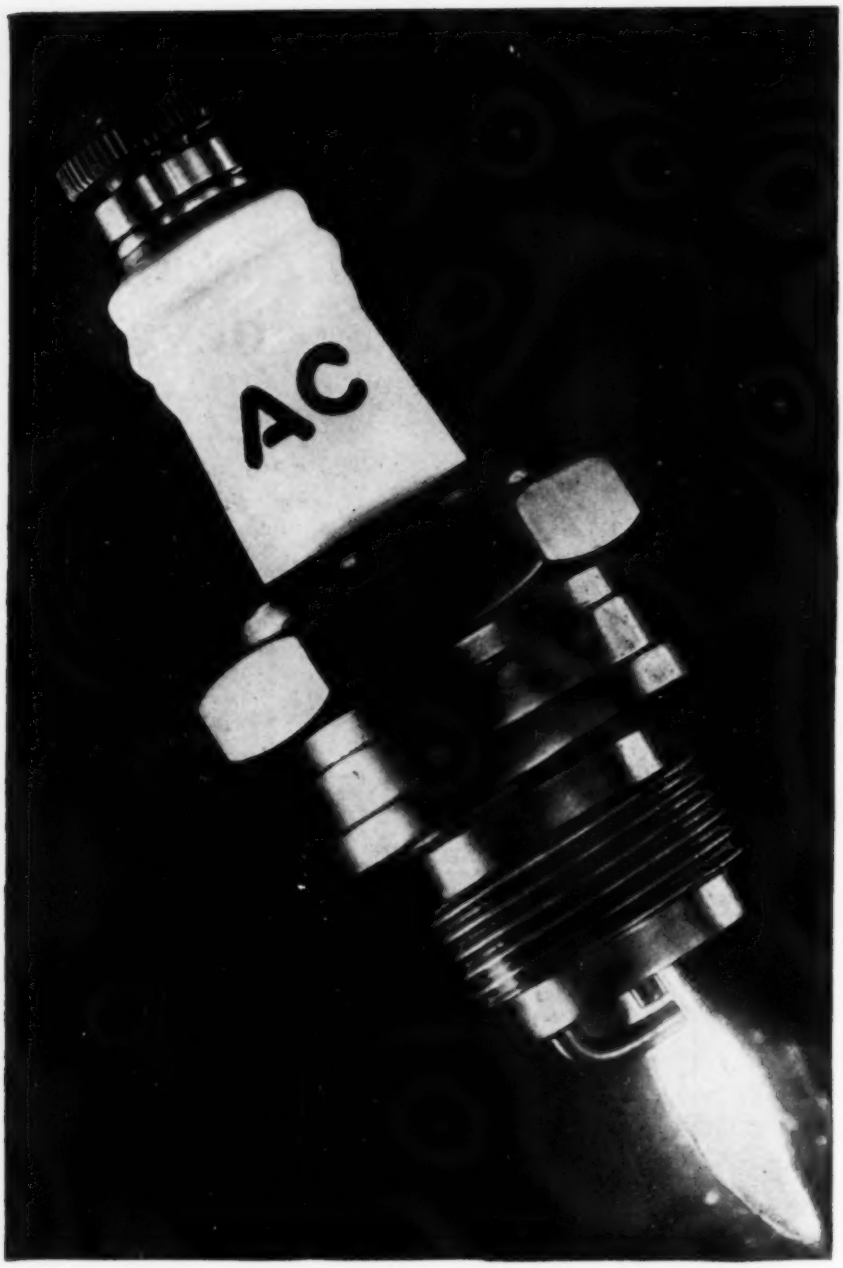
THE HOOF PRODUCTS CO. own Patent No. 1,726,725 and are exclusive licensees under patents granted and patents pending, covering Key-Control, Cantilever Spring, and Automatic Spark Advance principles used in the Hoof Governor.



The

HOOF GOVERNOR

Use S-2-A on your 1933 Chevrolets which provides for the automatic spark control.



47 LEADING TRUCK AND BUS MANUFACTURERS USE AC, THE QUALITY SPARK PLUG, AS REGULAR FACTORY EQUIPMENT

AND RECOMMEND ACs FOR REPLACEMENT

The dominant position of AC in the spark plug field is not a matter of chance . . . it is the direct result of building *quality* spark plugs. Leading automotive engineers have proved that AC quality delivers better performance over a longer period of time and at today's demands for much lower operating costs. As a result, these engineers have specified AC spark plugs for 7 out of every 10 trucks and buses built today. Fleet owners, too, can profit by "standardizing" on AC quality, because the correct AC spark plug in every unit will result in definitely improved performance and lower operating costs.

The AC Heat Range System is one of the greatest developments in the automotive industry today. It permits the fleet owners to select a hotter or colder plug to meet extreme operating conditions and to insure maximum performance and longer spark plug life.

AC SPARK PLUG CO.
FLINT, MICHIGAN ★ ST. CATHARINES, ONTARIO

Say "I saw it in FLEET OWNER"—It Helps!

FRIENDLY ENEMIES — They settle a tire question —

THERE'S ONE OF OUR COMPETITOR'S TRUCKS. THAT POOR DRIVER IS HAVING A TOUGH TIME
I'LL BET THIS DELAY WILL COST THE BOSS ANOTHER CUSTOMER, WHY DOESN'T HE BUY TIRES THAT CAN "TAKE IT"
MY BOSS IS SMART, HE USES GOODRICH TIRES. I HARDLY KNOW WHAT TIRE TROUBLE IS!
IT TOOK A DRIVER TO PUT ME WISE, BUT FROM NOW ON, IT'S GOODRICH TIRES FOR MY WHOLE FLEET OF TRUCKS
TIRE PERFORMANCE CHART
SIZE
SERIAL NO.
MILEAGE
DATE REMOVED

TRUCKING COSTS SLASHED

by this amazingly rugged Tire!

TRUCK-OPERATORS in all parts of the country and in every kind of business are making welcome savings in cost of operation by standardizing on Silvertowns.

A tougher, 15% deeper tread! Husky, double cleats that grip the road like a vise! Twenty-two per cent heavier gum fillings and improved insulated cord breakers that take all the punishing shock out of sharp, sudden road blows. A stronger, thicker carcass and the Goodrich Safety Ply reduce puncture and blowout risks to a minimum!

No wonder these tires laugh at wear and tear! No wonder they break mileage records and slash operating costs for truck owners all over the country.

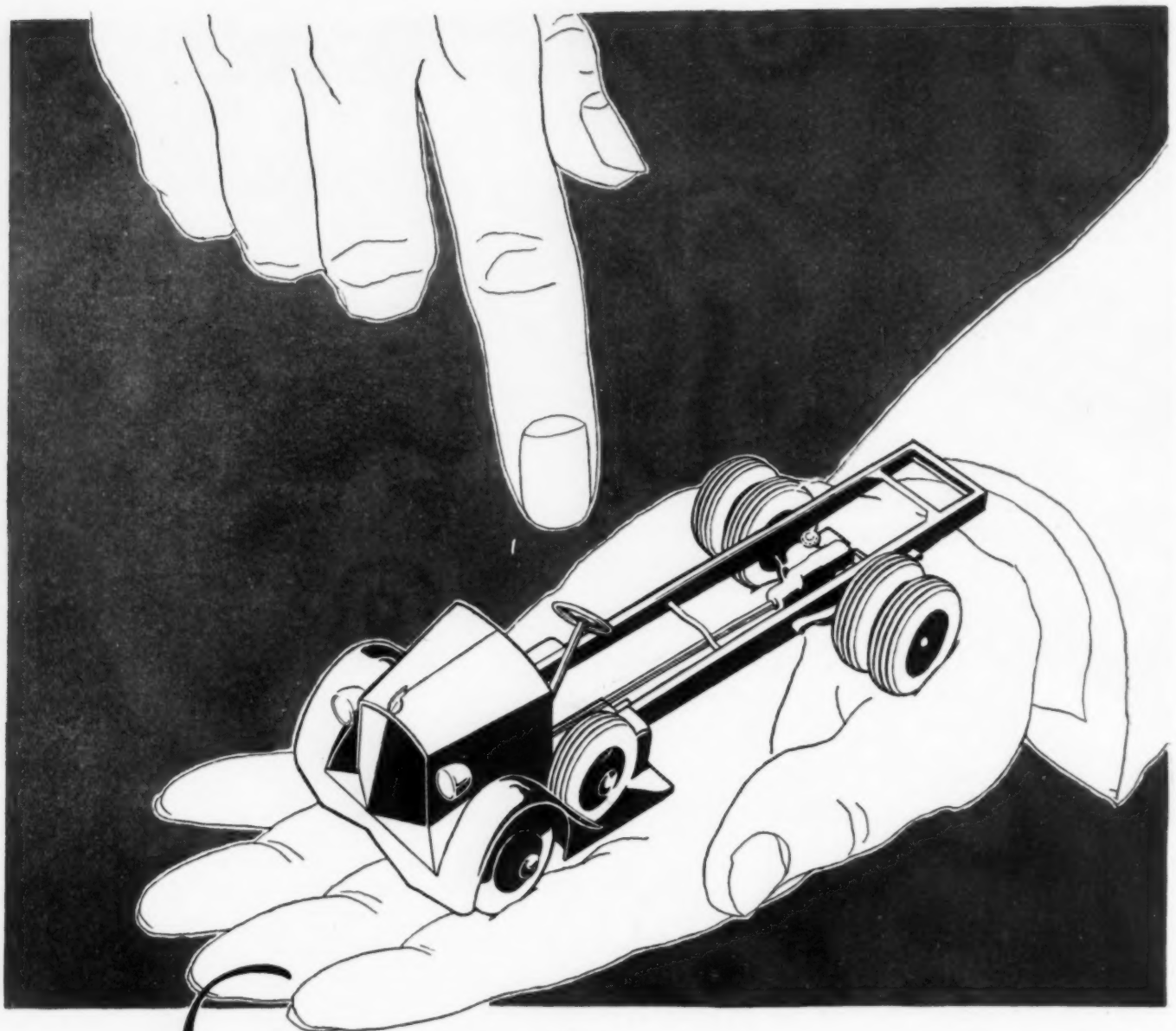
These Goodrich Safety Silvertowns "take it on the chin" day after day and still keep on delivering the goods.

You're in business for *profit*. You not only want MORE miles. You want FASTER miles . . . SAFER miles . . . CHEAPER miles. Get *all* the facts. Phone your Goodrich dealer NOW. Look for his name under "Tires" in your classified telephone directory.

Goodrich *Safety* Silvertowns

for Trucks and Buses

Say "I saw it in FLEET OWNER"—It Helps!



Selecting the proper control

IS NO LONGER A PROBLEM

Thanks to accurate maintenance figures, now immediately available, it is an easy matter to weigh first costs against the overwhelming economies of genuine Bendix-Westinghouse Air Control. Efficiency too, although never seriously questioned, is shown by these same figures to be just what you would expect from instant, powerful, Air Brake Conrol. In fewer words you can now view Air Brake Equipment as a sound investment thoroughly deserving the universal acceptance accorded it. Surely now, in the selection of braking equipment, there is little reason to be satisfied with anything short of the Bendix-Westinghouse standard of safety and satisfaction . . . and less to be puzzled as to what control is best suited to the modern scheme of highway transportation. Should you desire specific information regarding any phase of modern power brake control, address the Bendix-Westinghouse Automotive Air Brake Co., Pittsburgh, Pa.

BENDIX WESTINGHOUSE
AUTOMOTIVE AIR BRAKES

Say "I saw it in FLEET OWNER"—It Helps!

IN THIS DRUM

True anti-freeze economy

ZERONE GIVES

Complete, low cost protection

•

Keeps radiators and engines corrosion-free

•

Is made by **DU PONT**

makers of quality products

Du Pont Zerone not only saves you money, it saves motors and radiators too. We honestly believe you'll find Zerone worth investigating. Why? Read these reasons:

1. ZERONE gives complete radiator protection at all temperatures.
2. ZERONE does not readily evaporate.
3. ZERONE is economical to buy and use.
4. ZERONE has no offensive or unpleasant odor.
5. ZERONE maintains cooling plant efficiency.
6. ZERONE prevents rusting and corrosion. Tests show it affects radiators, pumps and connections even less than plain water.

See your source of supply for prices and full particulars.

Say "I saw it in FLEET OWNER"—It Helps!

"YESSIR, THIS IS SOME GUN"

FEATHER-TOUCH CONTROL* OF NEW DEVILBISS TYPE MB GUN REVOLUTIONIZES SPRAY-FINISHING

"Easiest, smoothest gun I ever handled"—"No more sore fingers"—"Produces better finishes"—"Finest atomization on synthetics"—these are some of the enthusiastic comments from management and operators using the new DeVilbiss Type MB Spray Gun with its remarkable Feather-Touch Control... This sensational gun is saving time and material, and is producing better results... With all its many new advantages, the Type MB retains—and even improves upon—the many fundamental, patented features which make DeVilbiss Guns so notable for efficiency, simplicity, economy, durability... Ask your local DeVilbiss distributor for full details of the new Type MB Spray Gun—or write us direct.

TRADE-IN

On a new DeVilbiss Type MB, we will, for a limited time, allow $3.00 on any spray gun you turn in (if it listed at $25.00 or more when purchased).

THE DEVILBISS COMPANY · TOLEDO, O.

New York Philadelphia Cleveland Detroit
Chicago St. Louis San Francisco
Windsor, Ontario

Distributors or direct sales and service representatives available everywhere

***FEATHER-TOUCH CONTROL ADVANTAGES**

Just a light touch on the trigger, and air pressure automatically releases needle spring tension, eases trigger operation, relieves operator of all finger, wrist or forearm strain. Shorter trigger travel; no stretching for trigger.

New perfect balance and scientific design of handle and trigger make gun fit the hand easily, comfortably, naturally.

Newly designed air passages; more air in head—better atomization at 10% to 15% lower pressure.

Clean-cut lines; highly polished surface; no irregular surface cavities to hold dirt; easy to clean.

RESULTS

Smoother, more even finishes — higher quality work; material applied at lower pressure, with better atomization.

Faster, easier operation—more air brought to gun nozzle, more material applied per minute.

More flexible than any other gun—easy adjustments make it adaptable to very delicate work, or to large industrial jobs.

All these new advantages at no increase in cost. Gun fits equipment now in use.

DeVilbiss

Say "I saw it in FLEET OWNER"—It Helps!

VOL. 11
NO. 3

The FLEET OWNER

SEPT.
1933

DEVOTED TO THE BETTER OPERATION AND MAINTENANCE OF TRUCK, TRAILER, BUS, TAXICAB, PASSENGER CAR, AND ALL AUTOMOTIVE FLEETS.

Stripping *the* Thread » »

(The Editor's Column)

Breathes there a man with soul so dead,
Who never unto himself hath said,
When on a bolt, he stripped the thread:
"*#..%x ')z**# v¼"*'##"**##"

OBJECT LESSON, NO. 12345

● We've been talking a lot about Preventive Maintenance in this publication lately and just had the importance of such a procedure forcibly brought home to us. It was on the occasion of going over our own chariot, prior to a 1,500-mile vacation trip. After adjusting ignition points and cleaning out the carburetor, we thought we'd "rev" up the motor to see if she'd take the throttle without spitting. While turning up fast, a fan blade broke off and was pushed into the radiator core. The net result: A new fan blade at 45 cents and a radiator repair job that cost $3.00. Might we ask those skeptics who are inclined to sneer or scoff at the idea of Preventive Maintenance: How much would it have cost us if the fan had let go while on the road? Wouldn't there be a slick towing charge and how about our being at the mercy of some incapable (and perhaps unscrupulous) garage mechanic? Can't you see how Preventive Maintenance pays? And which is more, had we properly inspected the fan blades, and replaced the fan in time, even the damage to the radiator would have been eliminated. Catch on?

●

WHO'S WRONG THIS TIME?

● A brake lining manufacturer on whom we recently called, voices the complaint that fleet mechanics "don't know how to apply brake lining." He says that the average fleet mechanic doesn't know the first thing about it and that the automotive jobbers don't, either. A bit out of order, we'd say. Nine chances out of ten he never visited a *good* fleet shop, like we are doing eight days a week, and a few evenings as well. We're sure the boys in the fleet field will back us up when we say that it's not necessary to send a flock of men in the field to *teach you* how to install brake lining. That's the type of stuff you learn by reading such publications as this one. As one fleet man put it: *"All they have to do is to make a good lining, advertise it to us, and give us a chance to use it. While we're not primarily in the automotive business, we know our brake costs and think we know our vehicles as well as anyone."* So that's off our chest, anyway.

●

WHAT! NO FREE LUNCH?

● A few months ago we reproduced the text of a retaliatory bill introduced (?) in the Georgia Legislature as a gesture against railroad lobbying, which is blamed for a lot of anti-truck measures these days. We just heard of another of these "gestures," introduced in Michigan, so we are told, which also puts the shoe on the other foot. It provides that: *"No railroad shall operate any train without first obtaining a certificate of necessity and convenience on each day of its operation; trains must be appropriately decorated on national holidays, decorations to include at least one stuffed eagle; brakemen carrying a bell and lantern must precede each train across a public highway; whistles must be tuned accurately in the key of C; lifeboats and life preservers must be carried on crossing streams 25 feet wide; parachutes and rubber heels are necessary when crossing any trestle more than 25 feet in height."* If more of these are born, perhaps we'll get free lunch and pretzels with our Pullman car beer. Who can tell. Who can tell.

●

FIXING 'EM FAST

● It was 7 A.M. Your Editor was peacefully slumbering in a farmhouse somewhere in Quebec. The telephone rang. At the other end was the driver-owner of a fruit truck whose acquaintance we had made the day before. He was stuck; a dead engine and three miles from civilization (such as it is up there) and wanted advice, knowing that we knew a *little* about truck motors. Well, to make a long story short, he asked us to borrow, beg or steal a new coil and drive up to the top of the mountain with it. "Are you sure it's the coil?" —"Positively," said he. We complied with his request, but without bringing a coil. We found that his coil, as we suspected, was o. k., but that the fibre block on the distributor arm had cracked. Instead of the points opening on the high spots of the cam, the fibre block would "give" and the points would not break. A spare contact-point arm (which we always carry) sent him on his way in five minutes. A good preventive maintenance inspection would have disclosed this crack before it got worse. Next time we take a vacation, we'll disguise ourself with smoked glasses, beard and cane.

●

IT'S NO SNAP, WE AGREE

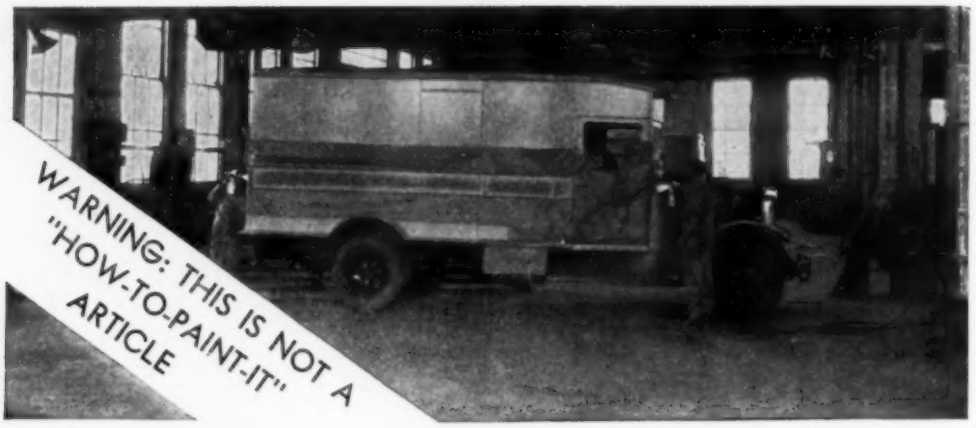
● Our stenographer observes that one of our readers abbreviates his title, which is Superintendent of Transportation, using only the initials, "S of T". We assured her that his job was not as soft as it looked.

« »

H. Clay Fischer
Editor

« »

Annual "Slick-Up" Cuts Painting Costs



Since "A Stitch in Time Saves Nine," You'll No Doubt Be Interested in This First-Hand, Cost-Cutting, "Slick-Up" Fleet Refinishing Experience

A GREAT deal of requests have come to us for semi-technical articles on the subject of paints and painting. Upon looking into the subject rather thoroughly, we have reached the conclusion that any article which we, or any paint specialist might get up, would *not* be found of *general* interest and value—all because of the fact that any "How-to-Paint-It" article revolves around the nature of the material used—and few paint manufacturers' procedure control is the same—even with the same *type* of finish.

The old-fashioned varnish enamels, the newer pyroxylin lacquers, and the still newer synthetic finishes—all of these call for different procedure control. And the condition of the paint on the vehicle itself plays no small part in the method of applying the refinishing coats.

So let us pass up the idea of a "How-to-Paint-It" article. You can get more real information on the subject by following the instructions of the makers of the particular product you are using. Their jobbers and salesmen are equipped with instruction manuals, a wealth of experience and a lot of data that applies directly to their own paint. And, as we've said before, you will find few of the instructions to be similar.

So that we should not be accused of "passing the buck" completely, and side-stepping the issue, we've succeeded in getting hold of a good experience story on "slicking-up." It's unfortunate that we cannot mention the name of the fleet whose experience is contained in the following paragraphs, but you can believe us when we say it's first-hand information, and not a lot of "swivel-chair" bunkum. Here it is:

"Slick-Up" Vs. Complete Refinishing

IN order to minimize the frequency of complete repaint jobs on the trucks in its fleet, the following touch-up procedure is carried out by one of the large national fleet operators, with shops in New York and principal cities throughout the country.

By

R. E. Finisher

Up until recently, it was the practice to paint the vehicles in this fleet to last until the end of the expected mechanical life of the unit; that is, until complete overhaul or general repair of the truck became necessary, at which time a complete paint job was also done. This included removing practically all of the old paint and the application of several new coats to bring the paint job up to company standards. The lettering, as well as the Company decalcomania, would have to be done over, also, making the complete job quite expensive.

One of the disadvantages accompanying this procedure was the fact that after a year or a year-and-a-half, the outer varnish coats would have deteriorated to such an extent that the vehicles would not only look shabby, but the undercoats, too, would begin to suffer, to such an extent that they were often too far gone to permit refinishing, or "slicking up" with a new outer coat of clear material. And the vehicle would be kept on the road, out of the paint-shop, because its mechanical condition did not call for a repair or overhaul job, allowing the paint to go "to the dogs" completely, when it could be "saved" by the application of a coat or two of clear finish.

But all of this has been changed, with the advent of modern spray-painting equipment. Now, vehicles in the fleet, having been in service a year, are called in and receive a "slicking-up" treatment on a definite schedule. And the job is done in a day. Thus, the basic color undercoats, along with the decalcomania of the Company, the lettering, name and trademarks, are all protected at the psychological moment, and the truck returned to the street with the loss of but one day. Here's some of the more intimate procedure followed in this fleet:

Procedure Control Outlined

FIRST, of course, a complete record is kept of the painting treatment of each vehicle, since its purchase, and it is known well in advance as to the exact date which each vehicle is due for its "slicking-up" day in the paint shop. Any extension in time, due to the paint still being in good shape, or

ONE of the large oil companies recently invested over $10,000 to equip all their 240 trucks with Bosch Volt-O-matic Generators!

By actual test, they had proved conclusively that this investment would soon pay for itself through substantial savings in maintenance and replacement costs.

The Bosch Volt-O-matic Generator does for the electrical system on your bus or truck what automatic regulation of the heating plant accomplishes for the home.

In a home, automatic regulation controls the amount of heat sent up by the furnace according to the constant rise or fall in temperature outdoors.

In a bus or truck, automatic regulation controls the amount of current produced, in accordance with the varying current consumption and momentary needs of the battery. As a result, the battery is protected as never before from overcharging and insufficient charging, those twin evils that endanger the complete dependability and economy of the battery.

Double Danger Avoided

Overcharging boils up the water in your battery. The plates buckle. The separators deteriorate. Short circuits result . . . your battery is ruined.

Insufficient charging is just as dangerous. The plates become sulphated. The capacity is greatly reduced. After a while the battery will take no charge. It is ruined!

The Bosch Volt-O-matic Generator eliminates both these menaces. It regulates the amount of current fed to the battery, as a thermostat controls the supply of heat in your home. When the battery is draining fast, the Bosch Volt-O-matic Generator automatically puts in a heavy charge. When the battery is full and the current needed is small, the Bosch Volt-O-matic Generator automatically cuts down the current supply.

What a difference in the dependable operation of your fleet! Gone is the danger, delay and expense of road breakdowns caused by hitherto unavoidable battery abuses. Battery repairs and premature replacements, caused by overcharging or undercharging, disappear. Since the battery is always well charged, your starting motor cranks the engine at high speeds, and assures you of a powerful starting spark.

And this is not all. The Bosch Volt-O-matic Generator is deliberately designed so that when the engine is running, the generator itself and *not the battery* carries the load of all current consumers. Result: Still greater savings in maintenance costs. You can use a smaller sized, hence lower priced battery. Your lamps cannot burn out from sudden excessive voltage, nor blow out from broken wires or corrosion of battery terminals.

New Low Prices

Prices on the most popular types of Bosch Volt-O-matic Generators, both for heavy duty and lighter duty service, have just been reduced in some instances as much as $26. If you have been searching for new ways to cut your operating cost-per-mile, mail coupon now.

Sold by

TRADE MARK BOSCH

UNITED AMERICAN BOSCH CORPORATION

SPRINGFIELD, MASS., U. S. A.

Branches: NEW YORK, CHICAGO, DETROIT
CANADIAN WAREHOUSE: TORONTO, CANADA

UNITED AMERICAN BOSCH CORPORATION, SPRINGFIELD, MASS. SEND BOOKLET ON SUBJECTS CHECKED:

PRODUCTS manufactured by the UNITED AMERICAN BOSCH CORP., bear the trademark shown above.

PRODUCTS OF UNITED AMERICAN BOSCH CORPORATION

- ☐ American Bosch Big Brute Coil
- ☐ American Bosch Condensers
- ☐ American Bosch Condens-O-Scope
- ☐ American Bosch Magnetos
- ☐ American Bosch Car-Radio

PRODUCTS OF ROBERT BOSCH A. G.

- Bosch Pyro-Action Spark Plugs ☐
- Bosch Super-Energy Magnetos ☐
- Bosch Semaphores ☐
- Bosch Vibro-Balanced Horns ☐
- Bosch Volt-O-matic Generators ☐ (23)

PRODUCTS manufactured by ROBERT BOSCH A. G., bear trademark shown above. Sold by United American Bosch Corporation.

WRITE NAME AND ADDRESS IN SPACE BELOW

Say "I saw it in FLEET OWNER"—It Helps!

"SLICK-UP" VS. COMPLETE REPAINTING (*Continued*)

because the truck is needed in service, can of course be determined by the garage foreman, and the responsibility of the paint job will then be shifted to his shoulders.

As the vehicle due for painting is delivered to the garage, it is tagged for the kind of paint job it is to get. It is then placed on the wash rack and body and cab are washed as usual. The running gear and under-the-chassis parts receive a special treatment with cleansing fluid. After the washing is completed the truck is taken to the paint shop, where it is allowed to dry completely before it is touched. The work, so far, has been done on the "night before."

In the morning, the first operation consists of a thorough cleaning of all foreign material not removed by the last-night's washing. Steel wool and a cleansing preparation are used on body panels and cabs. The roofs are then repainted in black by hand, and a 6-inch strip around the inside of the bottom of the body is also given a coat of black acid-resisting asphaltum paint. The latter operation is particularly desirable on electric trucks, but should be done to all trucks, because it has been found that wherever the steel body panel meets the oak sill, rusting will set in, and this type of paint is known to retard considerably such action.

You can't dodge refinishing costs, but with good equipment, you can cut them. No matter what kind of a fleet you operate, spray-finishing is today's method of "keeping up appearances" at low cost. (This photo and the one at the beginning of this article come to us through the courtesy of The Devilbiss Company, Toledo, Ohio.)

Next, any places where the paint has rubbed off, or has been discolored, are touched up with the standard Company colors; this being sprayed on, except in places that cannot be conveniently reached by the spray gun without shielding; here it is done by hand brushing.

The truck is then removed to a modern spray-booth, where an application of clear synthetic lacquer is applied with a spray gun, the painters being protected from the fumes by means of special inhalators. This application includes the entire upper structure; also the wheels, and is done very quickly. The truck is then pulled out of the booth and set aside to dry.

The chassis, which has received a thorough cleaning on the wash rack, to remove all grease and road grit, is next completely repainted with the standard company color (red) or touched up only in spots, according to specific needs.

The entire job, including washing, painting and drying, takes from 10 to 13 hours per vehicle, depending of course on the size and condition of the old paint at the time received in the shop. But the finished vehicle, when returned to service, presents an appearance very nearly equal to a complete repaint job.

No one will doubt the old saying: "A stitch in time saves nine." And that is exactly the moral conveyed by the painting procedure just related. Of course, it eventually becomes necessary to strip the old paint down to the bare wood or metal. When that situation stares you in the face, the best thing you can do is consult your paint maker's or jobber's salesman. He will give you the low-down on the best way to do the job. And you'll be free to choose your own material, so we won't try to influence you, either way.

While on the subject of paints and painting, we would like to say a few words regarding the new synthetic finishes (or enamels) which the paint makers are producing by modern chemistry methods.

Most of you fleet operators have already joined the ranks of satisfied users (we're not referring to any particular make, as there are many) and need not be told much about them.

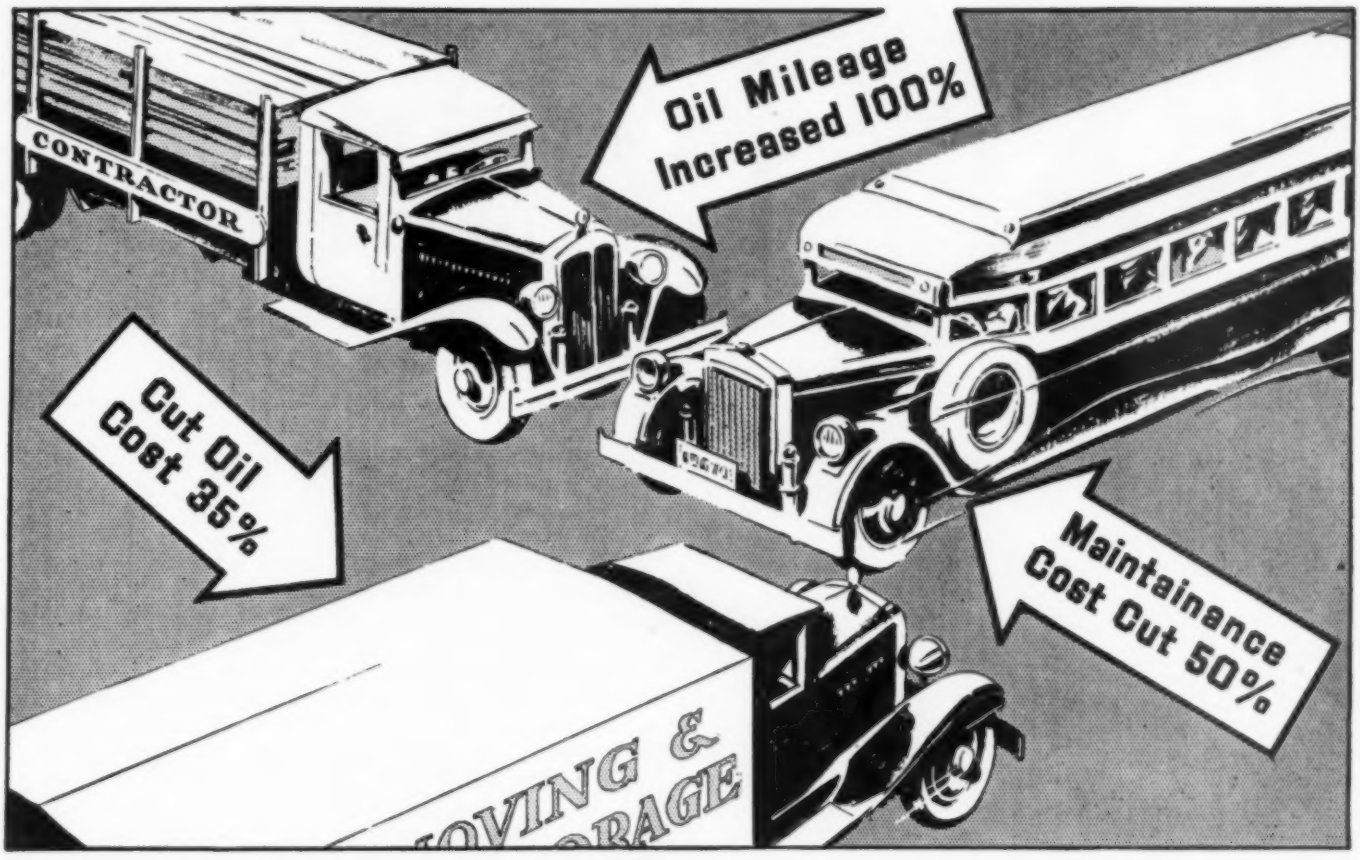
One of the prominent synthetic finishes requires only two coats. It makes unnecessary the former varnish protective coat and combines the color coat and the finishing, or third coat in one. In field tests and actual service on trucks over a four-year period, this finish has shown a 50% to 100% greater durability than ordinary finishes. Tests indicate that it will retain original color and appearance 50% to 100% beyond the time set by any "orthodox" paint finishes. And it can be applied by either spray or brush and dries very quickly.

Another synthetic finish is claimed to be highly resistant to oil, gasoline, fumes, salt brine, etc. As a rule, synthetics do not lift the old finish and dry with a high gloss. No elaborate pre-painting procedure is necessary. The old surface should simply be washed free of all grease, smoothed up a bit and be thoroughly dry. Then the synthetic can be put on.

And, as mentioned in this article, there's a clear synthetic also available, to be used in place of the old-fashioned slow-drying (or quick-drying) spar varnish. You've already read how one operator uses it to advantage to protect his basic undercoats.

Fleet operators should take advantage of the wealth of interesting literature that has been made available

(*Please turn to page* 41)



HUGE SAVINGS REVEALED BY RECORDS OF LARGE FLEETS

Oil and maintenance costs cut 35% to 62% by exclusive use of Tough-Film Pennzoil

STOP for a moment and figure the dollar and cents value of a 35% saving on the oil you buy in a year. Or add up your maintenance costs — labor, materials and overhead — and see if 50% of that figure wouldn't be a handsome extra profit.

Savings like these are being made by others right now. They're actual figures, from the private records of large fleets that have used other oils and then tried Pennzoil. Here are a few examples:

A motor express company: "On one regular route, we now use 2½ quarts of Pennzoil for the same mileage that required 6 quarts of our previous oil."

A large motor coach company: "Motor oil consumption 62% lower with Pennzoil, and maintenance costs lower than ever before."

A contractor (one of the largest in the country): "Oil consumption reduced 50% since changing to Pennzoil."

A large transfer line: "Have covered 2,500,000 miles in two years with Pennzoil, and have never had any expense due to faulty lubrication."

A large van company: "Pay a much higher price for Pennzoil than for oil formerly used, yet our records prove a 35% saving on oil."

A large transportation system: "Formerly used a low-priced oil. Changed to Pennzoil and cut maintenance costs 50%."

Hundreds of operators of large fleets have had similar experiences with *Tough-Film* Pennzoil. Hundreds of letters based on careful cost records prove that these savings are typical—and that you can save as much in the operation of your own fleet.

Tough-Film Pennzoil definitely cuts oil consumption because it's double-refined for toughness from pure Pennsylvania crude. It definitely cuts operating costs and reduces repairs because of its extra toughness. It provides a better power seal, reduces oil drag, and increases power.

Get the actual facts on oil performance. Let cost records of large fleets in your own business prove what Pennzoil can save you. Fill out and mail the coupon now for complete information.

Permit No. 2—Pennsylvania Grade Crude Oil Ass'n

100% Pure Pennsylvania
PENNZOIL
Safe Lubrication

THE PENNZOIL COMPANY
Executive Offices:
Oil City, Pa.; Los Angeles, Calif.
British-American Oil Co., Ltd.
Sole Distributors in Ontario and Quebec, Can.

THE PENNZOIL COMPANY FO-9
Oil City, Pennsylvania

Without obligation, send me the facts on how *Tough-Film* Pennzoil can save me money.

Name .....

Address .....

City ..... *State* .....

Copr. 1933 - The Pennzoil Company

Say "I saw it in FLEET OWNER"—It Helps!

By Clinton Brettell,
Supt. of Garages, R. H. Macy & Co., Inc., New York City, N. Y.

• SAFETY { ON THE ROAD / IN THE SHOP •

Part III — Maintenance and Supervisory Methods; Their Relation to Accidents; Three Systems of Inspection and Maintenance Keep Accidents Down

IN previous articles we have pointed out the various accident hazards both on the road and in the shop and have outlined ways and means to minimize, if not eliminate them. This concluding installment will discuss "Maintenance and Supervisory Methods" and their relation to accidents.

In our organization, we have three principal systems of inspection and maintenance to cover these details. These are as follows:

(A) **Driver's Report**—When a driver turns a car in at night, he makes a report, on a sheet provided for the purpose, either checking the vehicle "O. K.", or reporting any faults he has noticed with it during the day, and signing his name. These faults are checked over by a mechanic assigned, and corrected before the vehicle again goes on the road, and marked, on the same report, as corrected, accompanied by mechanic's signature. In checking over such reported troubles, others are disclosed to the mechanic, and corrected.

(B) **Daily Inspection**—There are inspectors at the doors as the cars are going out in the morning, and stopping action of the brakes is noted, as the driver brings the car up to the inspector, as well as testing of the hand brake to hold the car at rest. Lights, horn, steering gear and signals are given general looking over at the same time. It is then up to the driver to bring the car back, if for any reason he considers it unsafe to drive, and the final decision is left to the Garage Foreman, after his personal inspection.

DAILY
CAR INSPECTION REPORT

General Condition
(Good or Bad)
Chassis_____
Body & Curtains_____
Paint_____
Lubrication_____
Washing_____

R. H. Macy & Co.,
New York City.

Garage_____
Car No._____
Date_____

ITEM	TROUBLE FOUND	FIXED (✓) NOT " (x)	ITEM	TROUBLE FOUND	FIXED (✓) NOT " (x)

When a driver turns in his truck at night, he records the condition on this blank. Any faults indicated and subsequently discovered are corrected, and the work done is also indicated on this same report. This simplifies the work somewhat.

(C) **Periodic Inspections**—

(a) **Monthly**—Each vehicle is given a thorough checking-over at least once a month, being held in for a day, for that purpose.

(b) **Steering Gear Inspection**—A test of steering gear, for alignment, general condition, etc., as well as horn, lights, and signals, is made, on a regular monthly form (with use of the necessary apparatus), showing any corrective measures applied.

(c) **Brake Tests**—Each car is tested 3 times a month, for brake conditions, as follows:

(1) **Deceleration Test**—Each garage is equipped with a Tapley Decelerometer, and every 30 days each car is tested, to see that it comes within legal stopping distances for the service brake.

Also, a stopping test, of the emergency brake, but not for maximum deceleration, as we found that such a test caused such an excessive amount of maintenance, both to the brake itself, to the mechanism between the brake and rear wheels, and to the tires, as to be prohibitive, and not justified by any commensurate benefits obtained. We felt that we were compelled to do this, in order to be sure that the hand brake would come within requirements specified by the legal authorities, but after actually experiencing this excessive maintenance, we were compelled to very materially modify this drastic test. It now seems likely that an acceptable method will be to check the emergency brake by means of a static test, to determine whether it will hold the vehicle on a grade that would be the equivalent of the legal stopping distance as specified. This test would, of course, be augmented by inspection of brake linkage, lever positions, ratchet-and-pawl, brake lining, etc., and should give ample protection.

(2) **Equalization Test**—At many of our garages, we have a platform type of brake tester, on which we can duplicate actual road stopping conditions, and obtain direct readings on dials, showing the amount of brake application on each wheel. In this way, we are able to attain a proper equalization which is necessary for a safe stop without skidding, within the legal requirements, and with each brake doing its proper share of the work, thereby distributing strain and wear and tear uniformly, between all the various parts involved. A record of this test is also made on the same log sheet as the Tapley tests previously described; however, this is done every ten days.

If a vehicle fails on either of these tests, it is reported as unsatisfactory, correction of the fault is made, and recorded on the log sheet, and a subse-

(*Please turn to page* 18)

SEALED POWER

A NATURAL FOR FLEET SERVICE MEN

SUCCESSFUL fleet operation is built around service . . . and service is directly dependent upon the man in charge of maintenance who, in turn, must depend upon service in the form of dependable and coordinated parts when and where needed.

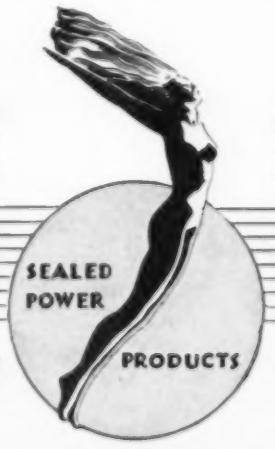
Sealed Power means new engine performance, a complete and coordinated unit of piston rings, piston and pin all engineered to work together.

Sealed Power products represent the finest the world affords in service (through 14 warehouses and 600 jobbers), quality and field engineering. Sealed Power is indeed the natural source of supply for fleet maintenance men EVERYWHERE.

★ See a Sealed Power Jobber or write to the Sealed Power engineering department for latest information on Sealed Power SPUN-IRON Cylinder Sleeves. Here is something new in real fleet economy in both installation and operation. "Spun-Iron" is absolutely free from porosity and hard spots . . . an accomplished ideal in cylinder wall metal.

SEALED POWER
Formerly The Piston Ring Company

CORPORATION
MUSKEGON, MICHIGAN



"SEALED POWER"

RESTORES NEW CAR PERFORMANCE

Say "I saw it in FLEET OWNER"—It Helps!

THOROUGH INSPECTIONS MINIMIZE ACCIDENTS (*Cont.*)

quent test made, showing proper results after correction of the faults.

The original of these reports is sent to the Superintendent's Office, and kept on record, both as a means of checking on the garages for proper performance of the schedule, and also, for actual evidence in case of accidents on any of the cars in question.

For the convenience of the Shop Foreman, a large log chart is provided at each garage, on which the car numbers are listed, vertically, and the calendar months horizontally across the top of the chart. Each month is divided into 3 columns, to allow for 3 tests on each car during the month, on a 10-day interval. As each car is tested, entry is made on this log sheet, of the date, so that cars can always be kept within the required schedule.

(3) **Auxiliary Tests** — Where any vehicle is involved in a personal injury accident, it is tested as soon as it comes in off the road, by our own organization, according to the methods indicated above. In addition, the manufacturer's service station for the make of car in question, is called upon, to conduct an outside test, and render a report, for use by way of expert testimony in case of court action.

We find that with the above system, which may sound quite complicated, but actually is not, by any means, so involved, we have ideal control of our brake situation, and at the same time, keep our brakes in such good equalization, that wear and tear on tires, brake mechanism itself, and other moving parts of the car, have been greatly reduced. Also, the other "Safety" details of our fleet, are kept in control.

While we have developed our systems to the point outlined above due to the nature of our business requiring an abnormal amount of braking, due to our many delivery stops, and, to some extent, by pressure of local authorities, we believe that it is a paying proposition, and one that could well be adopted, either in whole, or in part, by other fleet operators, as their needs might dictate.

GENERAL CONDITION
Chassis_____
Body & Curtains_____
Paint_____
Lubrication_____
Washing_____

CAR INSPECTION REPORT
R. H. Macy & Co. Inc
New York City

Garage_____
Car No._____
Date_____

ITEM	NAME	COND. GD.	COND. BAD	FIX	NOT FIX	LUBRIC. GD.	LUBRIC. BAD
1	Motor-Comp.						
	Timing						
	Knocks						
	Support						
2	Gas System						
	Carburetor & Control						
	Supply Tank						
	Vacuum Tank						
	Gas Line						
3	Starting Syste						
	Starter						
	Switch						
	Wiring						
	Crank						
	Battery						
4	Lighting						
	Generator						
	Switch						
	Wiring						
	Lights						
5	Cooling Syste						
	Radiator						
	Pump						
	Fan						
6	Clutch-Plates						
	Adjustment						
7	Transmission						
	Gears						
	Bearings						
	Case						
	Control						
8	Drive Shaft						
	Universal						
	Splines						
9	Rear-End						
	Gears						
	Bearings						
	Adjustment						
	Housing						
10	Wheels-Felloes						
	Spokes						
	Bearings						
	Rims						

ITEM	NAME	COND. GD.	COND. BAD	FIX	NOT FIX	LUBRIC. GD.	LUBRIC. BAD
11	Steering Gear						
	Front Axle						
12	Alignment						
	Knuckles						
	Springs						
	Set						
	Clips						
13	Bushings						
	Leaves						
	Frames-Align.						
	Cracks						
14	Goosenecks						
	Hangers						
	Rivets						
	Sub-frame						
	Brake-Adjust.						
	(Serv.)Control						
	Bands						
15	Bushings						
	Drums						
	Lining						
	Brake-Adj.						
	(Emerg) Control						
	Shoes						
16	Bushings						
	Lining						
	Drum						
17	Tires-Inflation						
	Condition						
	Body-Cab						
	Windshield						
	Curtains						
18	Screens						
	Gates						
	Doors						
	Accessories						
	Horn						
	Mirror						
	Fire Extng.						
19	Wiggler						
	Reflectors						
	Windsh. Wiper						
	Weight Plates						
	License						
20	Card						
	Plates						

Each vehicle is given a thorough checking-over at least once a month, being held in the garage for a day for this purpose. The inspection report used, as shown above, is unusually complete.

Any discussion on fleet safety should have a twofold purpose—that related to the humanitarian phase of the subject involved in personal injuries and/or fatalities; and the "commercial" side—that having to do with reduction of insurance premiums, accident repair costs, and "out-of-service" accident expense. I feel sure everyone will agree as to their relative importance.

In this connection, there is one premise (this may not be so universally accepted) which has always seemed to me to be very manifest in my twenty-two years of close association with both the maintenance and operating phases of fleet management—that "Operation and Operating Practices" has a much greater bearing on "Accident Experience" in most fleets, than has "Maintenance Practice."

To quote a national safety director: *"After all, the human machinery has fallen down rather than the autos. . . . We found that mechanical causes, at the outside, cause a very small percentage of accidents. We found that the personal element was the really big factor. Nevertheless, the car manufacturers keep plugging away for greater safety."*

It is next to impossible to obtain good operating practice, unless the vehicle is in good mechanical order. This depends to a great degree on the mechanical construction of the vehicle, its component units and its various accessories, all of which I have tried to outline in the two previous installments of this article.

The writer appreciates the opportunity of being asked to present this subject to fleet operators, most of whom are deeply concerned in motor vehicle safety, and wishes to express the thought that this discourse has not been so long as to become tiresome. At best, it is a subject that can scarcely be discussed, except at great length.

(EDITOR'S NOTE: Before releasing this series of articles, Mr. Brettell presented the data contained in them, before a meeting of commercial fleet operators in New York City, recently. We are glad to have the privilege of presenting this information, nationally.)

THE NEW-TYPE SAFETY BRAKE LINING

AMERICAN BRAKEBLOK

Fleet owners can operate their equipment with greater safety, at less cost per mile, by standardizing on this new-type safety brake lining.

THERE can be no question as to the economy of American Brakeblok in heavy-duty service—or in any service. Large fleet owners who keep exact records of brake performance have proved to their own complete satisfaction that this new-type safety brake lining gives longer, safer service at less cost per mile.

Uniform contact between the back of the material and the face of the shoe is a characteristic of American Brakeblok installations. Also, the alloy-mesh or grid backing adds strength, gives a secure anchorage and permits deeper counter-sinking, which in turn increases the thickness of usable material and lengthens service life. Due to the perfection of installation possible with American Brakeblok the necessity of a secondary adjustment is frequently eliminated.

While American Brakeblok is an entirely different type of brake material, it is installed without change in methods or in the original brakes. It replaces all other linings—on buses, trucks, and passenger cars. Its ability to withstand the extreme heats and pressures of heavy-duty service is one of its outstanding advantages in this field.

Write for complete information on any type of installation in which you are interested. American Brakeblok is available everywhere.

QUICK FACTS ABOUT AMERICAN BRAKEBLOK

This new type of braking material is:

—a dense, homogeneous solid—the same clear through.

—formed under pressure—not woven or laminated.

—scientifically heat-treated.

—ground to absolute uniformity in thickness.

—resistant to highest braking heats—contains no rubber.

—non-compressible under braking pressures—stays in adjustment longer, minimizing possibility of squeals.

—made with an alloy backing that gives greater thickness of usable material—longer life—and better installations.

AMERICAN BRAKEBLOK
Reg. U.S. Pat. Off.

AMERICAN BRAKEBLOK CORPORATION • 4660 MERRITT AVENUE • DETROIT, MICHIGAN, U. S. A.

New York, Cleveland, Chicago, St. Louis, Los Angeles, San Francisco

A Division of **American Brake Shoe and Foundry Company**

Say "I saw it in FLEET OWNER"—It Helps!

Our Experience with

Speed Governors

By C. H. Myers,

Transportation Mgr., Archer's Laundry, Baltimore, Md.

THE Editor has asked me to contribute an idea or two on certain factors that have a direct bearing on the elimination of overhead expense in the operation of a fleet of motor vehicles.

Now had he asked me to give a few pointers on how to increase this item, my task would have been very simple since there are one hundred methods by which an increase could be accomplished, to every one by which we may effect a reduction.

However I feel that in the subject of this article I have selected a subject that can no more easily be separated from any discussion of fleet overhead reduction than Amos could be separated from Andy.

The idea of equipping a fleet with speed governors is one that appears quite simple on the surface. It would appear to have one principal purpose, that of keeping your drivers within the speed limit as set forth by law, but the deeper one delves into the matter the wider becomes the appreciation of its full possibilities of saving money.

My own experience with the speed governors discloses to me that hidden beneath the simple idea of keeping within the speed limit we come upon an unexpected pot of gold in the form of dollars and cents savings on gasoline consumption, oil consumption, tire mileage, brake lining, engine wear and the very important item of accident avoidance.

That is quite an important array, but there it is, and through the operations of efficient speed governing units it will surely dry up your red ink well.

Some of these savings may be more or less intangible to the hit-or-miss fleet owner but to any organization who keeps an accurate accounting of costs (and I may say that our records are as accurate as I can make them), they become just as tangible as a new thousand dollar bill placed in the palm of your hand.

I have before me the results of a test conducted by the Carter Carburetor Corporation which will be astonishing to those of you who have not given the subject much thought.

The figures show the results of a gasoline mileage test made by the engineering department of a leading car manufacturer. In this test a car capable of giving 20 miles per gallon at 20 miles per hour, showed the following variations under different driving conditions: (*See data in next column*)

Constant Speed Tests (fixed throttle)

20 miles per hour	.....	20 miles per gal.
30 miles per hour	.....	19.7 miles per gal.
40 miles per hour	.....	18.3 miles per gal.
50 miles per hour	.....	15.9 miles per gal.
60 miles per hour	.....	12.2 miles per gal.

The above data compiled under the careful observation of experienced engineers will clearly explain why fleet operators are cutting their gasoline consumption 25 per cent and more by installing governors on every vehicle under their direction.

Here is another test that would seem incredible were it not from an authentic source and vouched for by both the A. A. A. and the U. S. Bureau of Standards. However, my own experience tends to verify both the above tests although of course we do not possess all the very expensive calibrated instruments with which to determine that our own fleet operation would be identical with these figures.

In an oil consumption test made by the Standard Oil Company of Indiana at the Indianapolis Speedway and on roads throughout the middle west, with 13 different makes of cars, the Standard Oil Company reports that—

"the percentage of increased oil consumption at 55 miles per hour as compared to the consumption at 30 miles per hour was 673 per cent. Therefore at 55 miles per hour about seven times as much oil was used in the same cars as that which was used at 30 miles per hour."

This data, compiled by the Technical Division of the Standard Oil Company, shows what a tremendous saving you can effect by controlling every vehicle under your direction to a reasonable speed with governors.

After having used many different types of governors, we decided some time ago that one, in particular, was the nearest one to perfection on the market and have accordingly adopted it as standard equipment on our entire fleet, with a consequent reduction of 27 per cent in the overhead operating cost of our fleet over a period of one year.

In conclusion I may say that one of the simplest and most efficient methods of stopping your money leaks is to subscribe to (AND READ THOROUGHLY) your trade papers, such as FLEET OWNER.

Just a couple of governors of the TYPE which Archer's Laundry is using. As to the MAKE—you'll have to ask Mr. Myers.
—H. C. F.

Use the CORRECT GRADE *of* O.K. GEAR LUBE *for every gear*

– *and you'll* REDUCE *replenishing costs* 25% TO 75%

THE heavier the demands you make upon a gear lubricant, the greater will be your savings if you use O.K. Gear Lube. We've proved that by literally scores of actual working tests in all sorts of equipment.

We can prove it in your equipment. We say that with assurance because Kendall O.K. Gear Lube just naturally *does things* no gear grease can do. It's an entirely new lubrication development that has completely changed previous ideas about gear lubricants. It's *all oil.* No fillers . . . no foreign ingredients to give it body . . . and a viscosity range up to 800 at 210° . . . an achievement never before equalled. It won't thin and foam in hot weather. It won't thicken and channel in cold weather. And if our tests prove anything it just *doesn't wear out.* It's the nearest approach to a *permanent gear lubricant* ever developed.

You may be skeptical about these statements . . . most of those who have tried it were skeptical . . . but you just can't get away from proof, especially when the performance is in your own equipment. And that's where we would like to prove our case to you . . . in your equipment. Will you let us? Drop us a line and we'll make the necessary arrangements. The Savings will be *yours.*

KENDALL REFINING COMPANY
BRADFORD, PENNA.

Say "I saw it in FLEET OWNER"—It Helps!

We Design a New Package Delivery Car

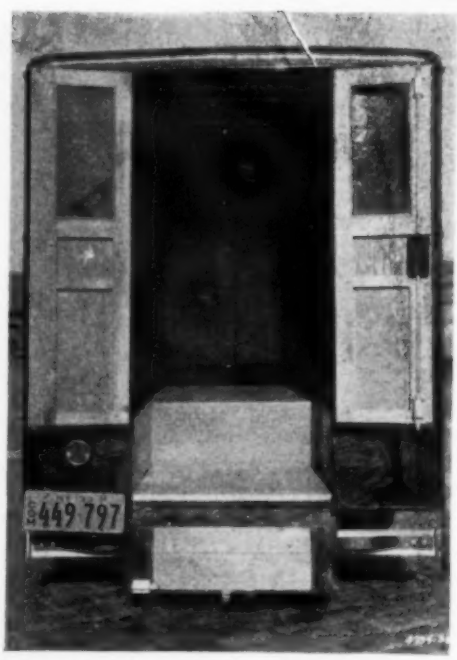
By Willard D. Bixby,

Manager of Motor Equipment
United Parcel Service,
New York City

A NEW package delivery car, especially designed to provide unusual carrying capacity and to simplify our driver's work, is being tried out by the United Parcel Service, a delivery organization which handles the delivery work of over 1,000 department stores and specialty shops located in New York City and in eight Pacific Coast Cities.

In each locality our company covers a wide-spread territory and the large volume of packages it receives from the stores it serves makes it very important that its cars have maximum capacity and special features which conserve the time of its drivers.

For example, the ease with which the operator can get in and out of the driving compartment is an important factor in speeding up his work, hence the newly designed cars have doorless driver compartments, yet are so constructed as to afford full protection from rain and cold. The mounting step is located so that the driver can swing naturally into his position on the seat. The windshield frame is curved in a wide sweep on each side in such a way as to deflect rain or cold, yet without blind spots which would make driving more dangerous. The driver in fact has greater vision than in the conventional design.



Rear view of new type package delivery car used by United Parcel Service, showing "well" in back which enables driver to walk inside without resorting to a stooped position

Another important feature is an arrangement which enables the driver to stand full height inside the body, making it possible for him to load and unload without resorting to a stooped position. This utility feature is made possible by a well which is built directly back of the rear wheel housings and extends the full width of the car with the well-floor only a short step above the ground. Another advantage afforded by this well is that it makes a place in which lamp standards and similar items can be carried erect, thus preventing damage to them and to other packages, which is bound to result when such articles are laid flat in a loaded car. Partly because of this well, the car has greater maximum capacity than any other package delivery car our company has ever used.

A time-saving method of loading a large delivery car is in use at our Los Angeles central plant. A belt conveyor on casters, with an independent motor and a variable-speed gear, is pulled out at the foot of the package chute and reaches right into the car, saving many steps and much lifting. As the car is filled, the conveyor is pushed back toward the chute

The rear doors are full length and there is no tail gate which can be used for over-loading. The small tail gate shown in the picture was installed to carry the bumper. It drops out of the driver's way when the doors are opened. The rear doors are opened only for access to the load. Tail gates are often a source of trouble because drivers find them an easy place to tie on bulky packages. Without tail gates such practice is eliminated and damage to merchandise and tail gate also, is avoided.

This car is the result of long experimentation to find the ideal package delivery car. The United Parcel Service has been operating 25 years and in that time has tried hundreds of different type bodies. Any car it uses must be conservative, yet attractive in appearance and have certain utility features peculiar

(*Please turn to page* 41)

This Mechanic Says—

"If ECCENTRIC Grinding is BEST for Production it's BEST for Service"

Every month a hundred thousand more new car, truck and bus motors are going into service with hardened valve seats ground in production by the ECCENTRIC method. Every month the list of leading car, truck and bus manufacturers who have adopted ECCENTRIC grinding in production grows larger.

This mechanic, like thousands of other good mechanics, knows that what the engineers have found BEST for production is always BEST for service. That's why service shops are adopting ECCENTRIC grinding for servicing both hardened and cast iron valve seats as superior to all other methods.

Find out for yourself why ECCENTRIC grinding is making other grinding methods obsolete. Do as the factories did: look at them all, then buy the HALL. Ask your jobber or write the factory for literature today.

HALL MANUFACTURING CO.
1620 Woodland Ave., Toledo Ohio
In Canada: Walkerville, Ontario

HALL Model E-S Grinder with Diamond Dresser Stand

Another HALL Tool You Need

Complete equipment for counterboring the seat, inserting standard or oversize seats of any type and spinning metal around the seat to make a *permanent* installation. Seats can't come out and cause trouble.

The *only* counterboring equipment with adjustable-blade Cutter Heads. 2 Cutter Heads cover range of 1 3/8" to 3 3/32". Handles surface or recessed seats and counterbored heads of variable angles. Made in power and hand types. Ask your Jobber.

Stop Wasting Fuel *through the* Exhaust

Part Two: The Tune-Up

LAST month, in our article entitled: "Stop Wasting Fuel Through the Exhaust," we outlined in detail the procedure followed in analyzing exhaust gases under the Cities Service Power Prover plan. After the vehicle under test has had its combustion efficiency analyzed, it is put through a rigid tune-up, which covers practically all of the vital components of its motor, including electrical system, valves, pistons, rings, timing and carburetor.

Perhaps the use of this service can best be made clear by oulining its application to a typical motor vehicle. When the car is presented for a test and tune-up, a careful record of the car and its motor is taken. This includes the owner's name and address, make, serial number, model, year and mileage. The make and type of motor is also noted, including ignition system, carburetor and fuel system. Carefully compiled data in the hands of the operator assist him in making the various specified adjustments.

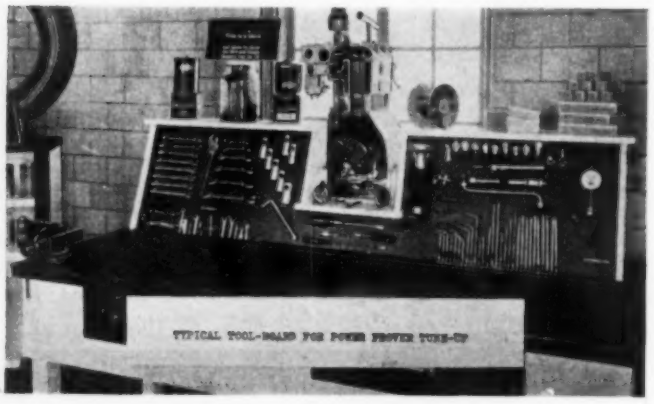
With the motor running, the sampling tip is attached to the exhaust pipe, and initial combustion efficiency readings taken at both idling and various running speeds. The operator knows in advance that the best performance and economy are obtained with combustion efficiencies of between 75% and 85%, depending upon the type and condition of the motor. Should the initial reading register above this, for example, 90% to 95%, he would consider the possible causes as:

1. *That the air-fuel ratio was providing too lean a mixture.*

2. *That the mixture was being diluted through air leaks in the intake manifold system, or around the stems of the intake valves.*

3. *That the valves were leaking. Defective intake valves allow spent gases to be driven into the intake system on exhaust strokes, which impair fuel mixtures. Defective exhaust valves permit redrawing into the cylinder of spent gases on suction strokes.*

4. *Leaks in the exhaust pipe, through aspirator action of the exhaust gas stream, would dilute the exhaust sample.*


TYPICAL TOOL-BOARD FOR POWER PROVER TUNE-UP

When the operator encounters a reading below the proper range, for example, between 50% and 60%, and these cases are by far the most common, he knows that the motor is not properly burning its fuel. Guided by this knowledge, as to general faults, he proceeds with the tune-up routine.

In all cases, the condition of the lubricating oil in the crankcase is determined. When found to be too thin, replacement with fresh oil will improve combustion efficiency 5% to 15%, as it improves the piston seal, and hence the compression.

The spark plugs are next removed and tested under air pressure, corresponding to the maximum compression encountered in the engine. If acceptable, the plugs are cleaned, adjusted to specified gaps with feeler gauages, and are ready to be restored to the engine.

Next a test is made of the ability of each cylinder to hold compression. This is accomplished by a gauge inserted in the spark plug hole, through which compressed air is admitted. The gauge has two dials, one indicating air pressure admitted to the cylinder, and the other indicating the pressure within the cylinder. If the pressure within the cylinder is less than that admitted, it will be seen that something is faulty, and the operator can rate each cylinder as to its degree of leakage: Zero indicating no leakage, and 1 to 10 indicating various degrees of leakage.

This method, conducted while the motor is silent, very frequently locates the point of leakage. Air leaking through the intake valves may be heard in the intake manifold or carburetor; leaky exhaust valves may be heard in the exhaust manifold; leaky rings may be heard at the breather pipe. If valve leakage is present, the tappet clearances are first checked up. Then if valve re-grinding is necessary, an immediate job is suggested. If, on the initial readings, the motor was shown to have abnormally high readings at high engine speeds, the cause frequently is due to "valve bounce" at high speeds, and is the result of weak or fatigued valve springs. After such indications, the tension of each valve spring is readily noted by a device which compresses the spring and indicates the pressure on a gauge. Weak or defective springs are recommended to be replaced.

Next the motor is carefully timed. Timing on the

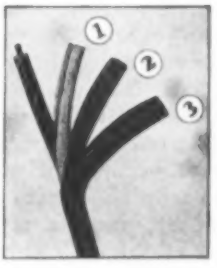
For today's rush hauling—347B

. . THE CABLE THAT "CAN TAKE IT"

The "new deal" has made almost every trucking order a "rush." Getting the business and holding it today depends on sticking to unusual schedules that have no leeway for equipment breakdowns.

You can depend on Packard's Super-Duty Ignition Cable — 347B. It is designed to stand up for many more miles of extreme service — to prevent costly ignition failure and eliminate frequent replacement.

Gambling on ignition cables that do not carry a full load of hot current to the plugs is false economy. On all your trucks — specify Packard 347B. Packard Electric Corporation, Warren, Ohio.



Built for Super-Duty Protected with Tri-ply Sheathing

1. Lacquered cotton braid
2. Varnished cambric tape
3. Strong braid, multiple "Lac-Kard" processed

Packard

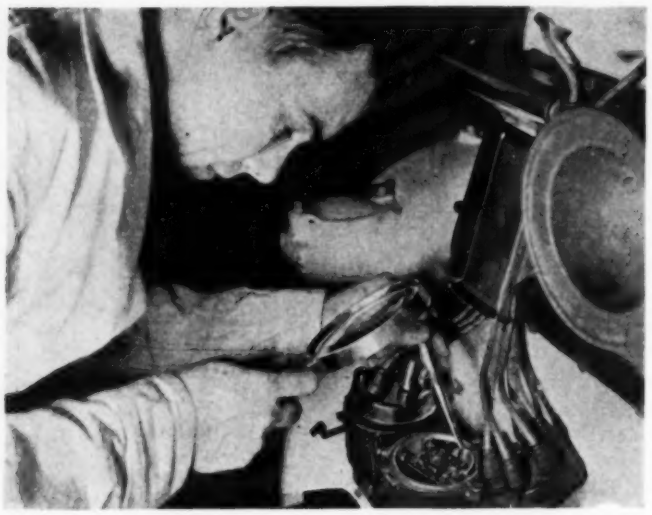
REG. U. S. PAT. OFF.
TRADE MARK

IGNITION CABLE • BATTERY CABLE • LIGHTING CABLE

The Standard Wiring Equipment of the Automotive Industry

Say "I saw it in FLEET OWNER"—It Helps!

A "HOW-TO-DO-IT" ARTICLE (*Continued*)



Exact timing adjustments are made both while the engine is stationary and while running. Timing is computed from exact piston positions and authentic specifications.

vast majority of cars encountered is found to be defective. On one series of 1,800 cars checked as to timing, only 20 were found to be correct. In this procedure, timing is adjusted from exact piston positions and the circuit breaker and distributor mechanism are carefully examined, and worn or defective parts replaced. At this point the plugs are replaced in the motor and it is warmed up to normal running temperature.

The next step is to verify the engine's timing at various speeds and here again it is found that exact timing adjustments made while the motor was stationary very frequently did not hold true, especially under high speed conditions. This, because, in some cases, of lag through wear of the mechanism; or through failure of the spark governor or automatic advance to function, or to function evenly as speeds were increased.

Speed timing is checked with a specially developed Neon Timing Lamp, connected in series with the secondary ignition system. The cylinder used in timing is checked again with the lamp, which provides a stroboscopic or slow-motion effect, so that marks placed on the flywheel and case, or the fan pulley and radiator, can be studied at high speeds. If found faulty, correction by adjustment or replacement is made.

The coil is tested through a variable spark gap connected between the coil and the distributor. If the current is found ample and jumps the gap, the coil is assumed to be sound. The condenser is checked for its ability to hold charges, with a device which indicates grounds, shorts or defective insulation. Supplementing this, the secondary wiring is gone over with a Neon pencil which, when traced along the wire, will flash brilliantly when a broken or defective wire is encountered. Such wiring is replaced.

At this point, when all adjustments to the ignition have been made, a second test of the combustion efficiency is made. If it is found that correct efficiency is still lacking, the carburetor is then adjusted. Under this procedure, it is interesting to note that a great majority of carburetors need little manipulation, especially since, under ordinary methods, the carburetor is usually subjected to adjustment before the other factors incidental to combustion have been touched.

In adjusting the carburetor, the operator is generally aided by constant references to his analyzer dial. If the needle moves away from the desired efficiency, he is making the wrong adjustments. If it moves toward it, he is on the right track. After the motor has been brought to its proper efficiency, the driver of the vehicle is asked to give it a brief road test to make sure of its starting, power, pick-up and performance. The instances where readjustment is necessary are remarkably rare.

It is interesting to note that within the last year and a half, over 2,500 fleets have taken advantage of this Power Prover Service. Thousands of vehicles in these fleets have been tested. Minor adjustments, inaccurately made, were in most cases causing losses of from 10 to 30 per cent of the gasolene used in these vehicles. Only a mere handful of them were getting maximum power and mileage.

As the Power Prover is also an accurate guide to the need for overhaul, the mileage interval between maintenance operations has been greatly lengthened. This results in greatly lowered maintenance costs, in addition to the decreased operating costs through the savings of gasolene and oil.

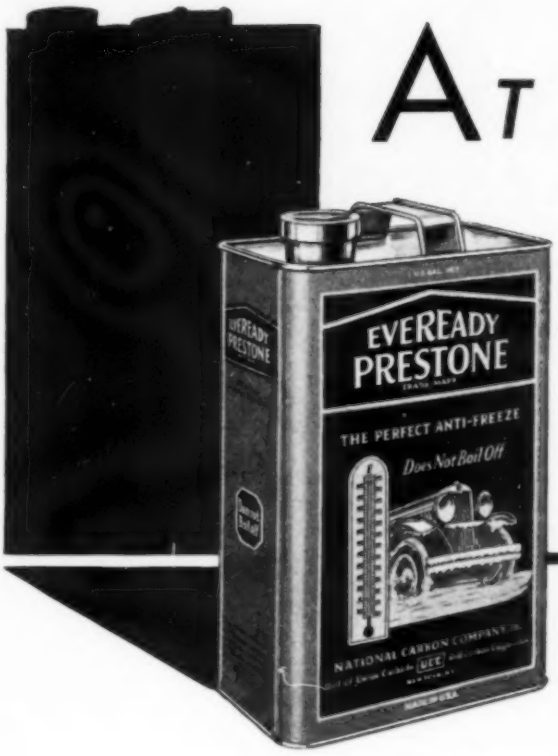
The results reported by users of Power Prover service are many and varied. A few specific examples follow:

The Federal Concrete Company of Buffalo, N. Y., had a gasolene powered locomotive on a large construction job. Hard starting was a grave problem. For the past two years, during which a premium gasolene was used, it was impossible to start the motor by means of the starter. The locomotive would get under way only after it was pushed by a steam crane. Since it was Power Proved, however, it has responded quickly and easily to the starter, operating satisfactorily all day long on a straight run gasolene. The saving in gasolene alone amounts to 3c a gallon. In addition the locomotive can now easily move three gondola cars loaded with sand and gravel, whereas previously it could move but two.

Another interesting saving reported by the DeLuxe

(*Please turn to page* 41)

Total maintenance costs of the St. Joseph Railway, through exhaust gas analysis and proper tune-up, were reduced from 2.72 to 2.55 cents per mile. Miles per gallon of gasoline were also increased by 9.95 per cent.



AT THE NEW PRICE EVEREADY PRESTONE

> > > IS CHEAPER THAN IDLING MOTORS < < <

ALTHOUGH the high cost of idling motors throughout the winter has been pointed out to truck owners by authorities, little could be done to stop this needless waste of money in the past.

Alcohol was the only inexpensive anti-freeze available, and alcohol, boiling at comparatively low temperatures, had a strong tendency to boil out, often before the normal operating temperature of the heavy duty truck motor was reached. If the engine operated at normal, the alcohol was gone and had to be replaced; if the engine didn't reach normal, the cost of fuel was excessive. The total cost of operating under these conditions was high.

U. S. Bureau of Standards

An idling motor consumes fuel which must be charged against the cost of winter operation. In addition, the U. S. Bureau of Standards has pointed out that crankcase dilution may jump from as low as 5% in summer to 50% in winter. Truck and bus manufacturers charge considerable of this increase to the practice of idling motors.

Crankcase dilution leads to excessive wear of moving parts because of impaired lubrication, and excessive wear will result in greater oil consumption—all of which costs money . . . lots of money!

Idling Causes Cold Motors

Idling means cold motors, and there is more condensation of water in the crankcase of a cold motor. Both the U. S. Bureau of Standards and prominent truck manufacturers point out that water in the crankcase can cause serious corrosion, besides the possibility of the water freezing and preventing circulation of the lubricating oil.

But now Eveready Prestone has been reduced in price, and this winter, idling motors are going to cost their operators more money than Eveready Prestone-protected motors — and truck and bus operators will prove for themselves that Eveready Prestone is the "two-way anti-freeze" for commercial vehicles, giving complete protection against *both* rusting and freezing.

Eveready Prestone Permits Normal Temperature

With Eveready Prestone in the cooling-system, truck motors can operate at their designed normal without loss of anti-freeze. The boiling point of Eveready Prestone is so high that motors can operate at the peak of efficiency at high speed or under heavy load; this means full power at minimum cost of operation.

Eveready Prestone is specially treated to prevent the corrosive effect of water on the cooling-system and to prevent the formation of rust which might lead to expensive clogging trouble.

A special staff of trained cooling-system experts is available to help individual truck owners with cooling-system problems. Investigate Eveready Prestone now—*before* freezing weather, and save yourself trouble and expense later on.

NATIONAL CARBON COMPANY, INC.
General Offices: New York, N. Y.
Unit of Union Carbide UCC *and Carbon Corporation*

Do They Get HOT? Here Are 24 Reasons WHY

By Frank P. Illsley,
Cooling System Engineer, Detroit, Mich.

DURING the hot spell which all of us have gone through in the last few months, many fleet operators have experienced troubles with steaming radiators, loss of water and attendant overheating ills. It was our purpose to get these few thoughts on the subject to you last month, but the article was crowded out by others of equal importance. While there's still some warm weather left, you'll probably find these slants on the causes of overheating exceedingly interesting, so here goes:

Most overheating occurs from such causes as bad roads, torrid weather, heavy loads, long hills, sand, mud, high altitudes, etc., to say nothing of clogged cooling systems and plugged radiators. An equally important problem is that of fleet operations on routes where hard water is the only kind available, and this factor tends to further impair the cooling system, by furthering deposits of scale.

Overheating can sometimes be divided into two stages: that due to weather and load conditions, and that which arises regardless of weather or load, generally caused by other factors which throw the water out the overflow and deplete the supply until overheating is brought on, even in cold weather.

There are two principal causes for this second condition, and each is a consequence of higher traffic speeds and the quicker brake stops which this involves. In other words, whenever the vehicle speed is suddenly checked, the water is caused to surge up into the top tank and more or less of it goes out through the overflow.

Likewise, whenever the engine is suddenly throttled down, when the vehicle is coasting, or being stopped to handle passengers, the water-pump is likewise slowed down. This cuts off the flow of water up and around the exhaust valve seats and other hot engine surfaces before all of the accumulated heat in these parts has been carried off. The result is that such water as is in contact with these parts is popped up to the boiling point and belches out through the overflow.

Under these conditions, no matter how full the radiator was at the start of the run, or how cool the day, only a certain number of quick stops are required before enough water (or expensive anti-freeze in winter) has been thrown out through the overflow as to induce a condition of genuine boiling and overheating.

Next, as another contributing cause, comes the less recognized problem of steam pockets which are apt to occur in the vicinity of the exhaust valves, which belch out the water located between them and the top tank. Another condition often encountered in some instances of partly clogged radiators, where powerful pumps are used, is that the pump will deliver water into the top radiator tank faster than it can flow down through the partly blocked-up radiator tubes. This, of course, means that more or less water will be forced out through the overflow.

This last-mentioned trouble will be found to occur in cycles. The pump sucks the bottom tank dry, shoots this volume of water into the top tank and out the overflow, and then it must wait until the water has worked its way down into the lower tank again, when the cycle is repeated, and it continues until a boiling condition manifests itself.

Next come conditions which cause mud, oil, etc., to collect on the radiator fins, and involve expense for frequent cleaning off, if satisfactory performance is to be obtained and overheating is to be avoided. This is particularly noticeable on jobs having air compressors mounted directly behind the radiator core, which serve to suck in just so much more dirt, mud and foreign material.

Some of the causes of overheating mentioned in the foregoing paragraphs may be allowed to continue indefinitely before the operator goes to the expense of correcting them. In many instances, they are entirely overlooked, the maintenance department going through other cooling system overhaul methods, but often neglecting the potential causes, such as have been outlined here.

Practically 95% of all water loss in overheating mo-

(*Please turn to page* 42)

New Slants on Overheating Causes:

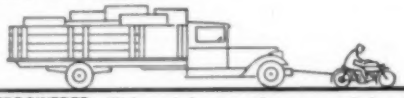
1. Surge losses due to quick braking in congested traffic.
2. Peak boiling due to free-wheeling in hot weather.
3. Belching caused by steam pockets due to high-level pumps.
4. Faulty thermostats (chiefly those poorly-made ones used with some car heaters).
5. Summer boiling caused by sediment-loaded radiators.
6. Undersized radiators.
7. Partial overheating due to hot weather,—heavy loads,—high altitudes,—mountain driving,—hard pulling on long hills,—in sand,—in mud.
8. Leaky cylinder head gasket.
9. Slipping fan belt.
10. Broken belt.
11. Pump spinner loose on shaft.
12. Pump pulley loose on shaft.
13. Clogged muffler.
14. Valves out of time.
15. Ignition out of time.
16. Sticking of fly-weights in automatic spark advance.
17. Dragging brakes.
18. Stoppage in water hose.
19. Porous cylinder walls.
20. Failure of incoming water to be distributed equally to all cylinders, due to loosened or rust-eaten distributor manifold.
21. "Dead" thermostats in automatic shutters.
22. Tardy opening of shutters, due to friction in rusted mechanism.
23. Leaky water pump gland—leaky hose—leaky radiator.
24. Loose baffle plates in radiator.

I'M STALLED AGAIN . . THAT'S THE THIRD TIME IT HAS HAPPENED THIS WEEK!
UNDERPOWERED, EH? WE HAD THAT TROUBLE, TOO — BUT NOW THE BOSS KNOWS WHAT HE'S BUYING. HE GOES BY THE REO SLIDE-RULE

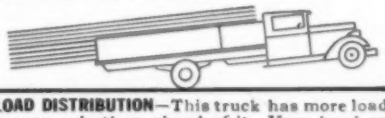
Why GUESS *what truck to buy..*

WHEN THIS SLIDE-RULE PROVIDES THE ANSWER

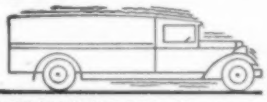
Reo salesmen are trained to talk facts. They analyze your problem, tell you what you need—and leave the decision to you. Many an operator has run down the source of excessive costs and irregularities of service by calling in a Reo man. Would you like the Reo Slide-Rule check-up? No obligation whatever. Just write Reo—or 'phone your Reo dealer.



UNDERPOWERED—This unit is so underpowered that gear ratio "doctoring" is necessary to compensate. The result: increased piston travel and gas consumption reduced daily range of travel.



BAD LOAD DISTRIBUTION—This truck has more load back of the rear axle than ahead of it. Very hard on rear tires, axles, gears, bearings, springs and frame. Steering and front brake efficiency greatly reduced when climbing hills.



WRONG GEAR RATIO—Here is a truck that is geared so low for occasional heavy pulls that the engine races and shakes itself to pieces trying to keep up with traffic on level roads.

● Why let a salesman's optimistic claims determine your choice of a truck, when the Reo copyrighted Slide-Rule makes the decision with mathematical accuracy? With this impartial, fact-finding device, guesswork and idle talk are eliminated from the truck deal. You buy exactly what you need.

BUILT RIGHT—Reo can accept the Slide-Rule's verdict because Reo trucks are built to do an extraordinary job. Only a truck with a Gold Crown Engine can be expected to stand the usage and deliver the miles you get from a Reo.

SOLD RIGHT—Reo salesmen are trained to confine themselves to facts—facts as disclosed by the Slide-Rule and the Reo system of Ability Rating, which tells you precisely what specifications a truck must have to operate with maximum long-life and economy under any given conditions.

AND THEY LAST—Reo's reputation as "the longest-lived truck built" reflects Reo's traditional policy of giving more than the average value. There are Reo trucks in operation today that have seen steady service for 12 and 14 years. And the 1933 Reo Trucks, Speedwagons and Trailers are better than ever before.

WRITE today for the Reo Truck Work Sheet upon which you may list information that will enable Reo to tell you the right power, capacity and wheelbase needed in your operation for the longest lasting truck performance. No obligation.

$575 AND UP

Reo Speedwagons and Trucks range from 1½-6 Tons. Price Range—$575-$2,595. 34 wheelbases — 4's-6's-8's. Tractor-Trailer units from 15,000 to 32,000 lbs., gross. All prices chassis f. o. b. Lansing, plus tax.

REO MOTOR CAR CO.
LANSING—TORONTO

TROUBLE SHOOTER

(You Ask 'Em — We Answer 'Em)

A department, devoted to correspondence from readers of FLEET OWNER. Any questions having to do with automotive service will be answered in this department. All properly signed inquiries will be replied to by mail and such of them as are believed to be of possible interest to other readers will be published in these columns.

Again, When to Change the Oil?

Question: We have a fleet of Brockway trucks with Wisconsin motors, purchased during 1928 and 1929. These are light 1½-ton, 4-cylinder jobs and are used for deliveries around the city. The average load of our trucks is about a ton, and would consist of five or six small deliveries. Being located in heavy traffic districts, the motors are subjected to plenty of idling.

We are trying to adopt a safe blanket oil-change policy for the entire fleet and have asked the opinions of many authorities. Some say to change every 500 miles; others every 1,000 and in one case every 1,500 miles. We certainly would appreciate your opinion on this problem. We realize that it is not an easy decision to reach without knowing the actual condition of the motors, but thought that perhaps you could offer some useful suggestion, based on your experience with fleet operators.—F. X. F., New York, N. Y.

Answer: We will attempt to answer this very delicate question, but feel sure that there will be many exceptions taken to it, as the subject is highly controversial.

Since your fleet is used in heavy traffic and there is plenty of idling, the oftener you change oil, the better. However, we believe that 500 miles is too soon, and if the motors are in good mechanical condition, would say that 1,500 miles should be your maximum, especially in the winter months.

There is more to this question than one can put down on paper. Have you ever had samples of your crankcase drainings analyzed by an oil chemist? It might pay you to have this done from several of your vehicles. The information that you would get from so doing, would answer your question better than *anyone* can; it would also help you to determine the proper overhaul period for the engines.

It might even pay you to change at 500 miles, in order to make certain of the oil's condition, and then put in an oil reclaimer. This would eliminate the waste of throwing away the used oil and you would be practically assured of good lubrication at all times, provided, of course, that you used a quality oil in the first place.

Your Editor, of course, has a great many personal reactions on the subject of lubricating oil. He will be glad to pass them on to you, next time he is in your neighborhood.

●

Distributor Caps Crack on Truck Motor

Question: We have a Dodge 1½-tonner, Series E, which we have found, about every five or six months, cracks the distributor caps. This truck has been doing this for about two years and we have been unable to locate the cause of the trouble. We have been using the original equipment cap as a replacement. If you can give us any information which would lead to the solution, it would be greatly appreciated.—S. G., Fairfield, Iowa.

Answer: When replacing the distributor cap, we would suggest that you replace the rotor as well, as it is quite likely that this is either burned or worn to such an extent that there is excessive clearance between the rotor and the segments in the cap. This causes excessive arcing.

Another thing, see that the spark plug gaps are not too wide. This might also cause arcing inside of the cap.

It is also important to make sure that the rotor is timed so that it is exactly opposite the segments in the cap when the points break. We don't see how this could get out of time, but if through some error the points are breaking when the rotor is *between* the segments, the spark will have too far to jump inside of the cap and will cause burning and subsequent cracking. We see no other reason for the cracking which you mention.

●

Both Wheels Slip, Says He

DEAR Editor: "In reply to your question in the Trouble Shooters' Department of a recent issue, relative to wheel slippage on railway cars, permit me to offer the following:

"At extremely slow speed, due to banking on turns, the greatest weight is thrown on the inside wheels, and therefore the outside wheels slip. However, at extremely high speeds, centrifugal force throws much greater weight on the outer wheels, thereby causing the inner wheels to slip."—*Chas. A. Meyer, Supt., Fishkill Electric Railway Company, Beacon, N. Y.*

You May Not Believe It!

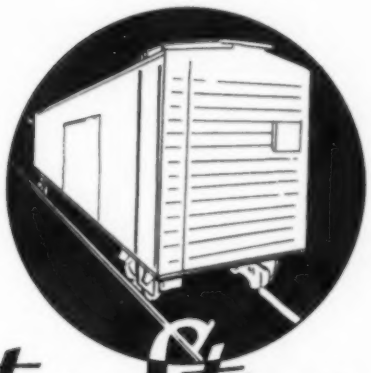
(But It's True)

THE FACT:

UNDER-INFLATION, besides being ruinous to pneumatic tires, also causes a considerable increase in gasoline consumption. In other words, soft tires waste gasoline.

THE PROOF:

AFTER three months of research, Ray G. Paustian, of the Iowa State Highway Commission, has obtained actual data to prove that gasoline mileage has a direct ratio to tire inflation. These data show that for every 10 pounds the tire is allowed to drop below its normal pressure, an 8 per cent decrease in mileage is obtained from gasoline.



The Brute Strength of a BOX CAR

That's Why Body Builders Are Strong for PHEMALOID

Under actual service conditions, for twenty months, PHEMALOID on a Frisco box car, has demonstrated that it has the strength and durability required of box car materials. Today the Phemaloid on this car is as good as the day it was installed. You can take advantage of Phemaloid's strength and durability in your body construction. It can be employed for flooring, interior lining, roof, and some types of jobs for exterior sheathing. Phemaloid is so different from ordinary plywood commonly used in body construction that it must be considered from an entirely different perspective. . . . Consider these characteristics of Phemaloid. It resists rot. The phenol resin adhesive used in its manufacture is impervious to moisture, mold and fungi. It is unaffected by oil and gasoline, washing compound, or wood preserving compound. . . If you want large panels, we have them. Stock sizes are, 6′ x 8′, 8′ x 11½′ and 8′ x 17′. Phemaloid offers all these qualities at attractive prices.

Frisco car sheathed with PHEMALOID.

PLYWOOD HASKELITE PLYMETL

HASKELITE MANUFACTURING CORPORATION

208 WEST WASHINGTON STREET, CHICAGO ILLINOIS.

Say "I saw it in FLEET OWNER"—It Helps!

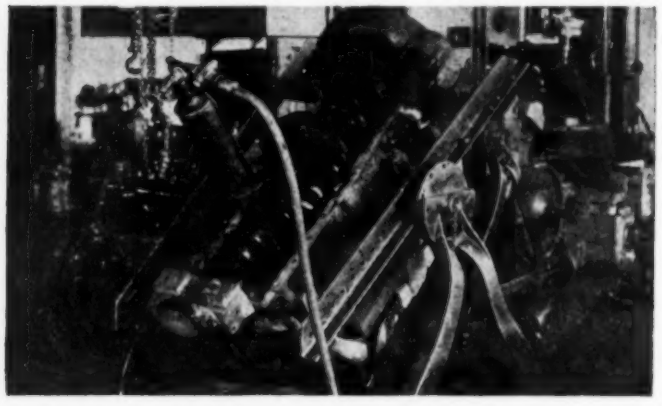
TROUBLE SHOOTERS' DEPARTMENT (*Continued*)

How to Make an Oil-Pressure Test

Question: Now that the weather is warmer, we are having trouble in maintaining the oil pressure on several of our engines with pressure lubricating systems. If we adjust the screw so that we get sufficient pressure, the engines will seem to pump oil—at least the exhaust is a thick blue smoke.

We want to be sure of sufficient lubrication, yet we do not want to consume an abnormal quantity of oil. Is there any practical method of satisfactorily solving the oil-pressure problem, or do you know of any way to test the bearings for oil leakage? We are told that even though the bearings do not knock, there can be sufficient clearance to keep the oil pressure down, but how can we make sure without dismantling the bearing caps?—E. R. L., Memphis, Tenn.

Answer: Many cases reported as "low oil pressure" are caused by loose or broken main bearings. An ingenious fleet maintenance man has designed the device shown in the accompanying photograph for testing loose or worn main bearings on his fleet of buses. It was made right in the shop, as follows:



A cylinder holding about a half-gallon of oil was made out of a piece of steel pipe and connected to the oil system of the engine in question. This can be done right on the vehicle without removing anything but the oil-pan. A large drip-pan can be put under the engine to catch the excess oil. The shop air pressure is applied to the top of the container and the oil is forced out through the different bearings.

With this device you can easily see which bearings are throwing excessive oil and in a case where a connecting-rod bearing repeatedly burns out it will generally be because it has been "starved" due to the oil dropping out of a loose main bearing.

By making a device of this character and using it as outlined, we believe that you will be able to take care of your oil pressure problem.

●

Keeping the Gas Out of the Crankcase

Question: We have a 1931 *Chevrolet truck and can't stop the gasoline from going into the crankcase. Thinking that it might be caused by the fuel pump, we replaced the diaphragms and later used a new fuel pump, but to no avail. We find two quarts of gasoline in the crankcase after about* 200 *miles of driving.—C. Y., Mamou, La.*

Answer: We would suggest that you take the carburetor off and have it gone over by a Carter carburetor service station. It is possible that your accelerating pump is not working properly, or that the float level needs attention. The butterfly choke might also be out of adjustment.

It is also likely that your engine might need reconditioning as far as the pistons and rings are concerned. You can probably tell this better than we can. Since you have checked the fuel pump, our guess is that it's a faulty carburetor, or poor ignition.

●

Shop Hint for Ford Wheels

DEAR Editor: "When putting on the rear wheels of Model A Fords, we sometimes find that after installing new lining, it is difficult to get the wheels on, due to the lining contacting the wheels, even when all adjustment is backed off. To speed this job up, we run the motor with the transmission in low speed and let this rotate the wheel after it is started on the shaft. As it is rotating, we hit it with a block of wood and heavy hammer, driving it gradually on until it seats on the taper. This provides a burnishing effect for the lining, and makes a hard job easy, particularly where the drums are a bit worn."—*H. D., New York, N. Y.*

●

How to Measure Acceleration

HOW fast a vehicle can pick up speed or put on the brakes is generally of little concern to a passenger, who is likely to leave such matters to the driver, and continue reading his newspaper. But for the benefit of the latter W. B. Potter, of the General Electric Company, has devised a small meter which gives such information at a glance, as well as indicating the per cent grade.

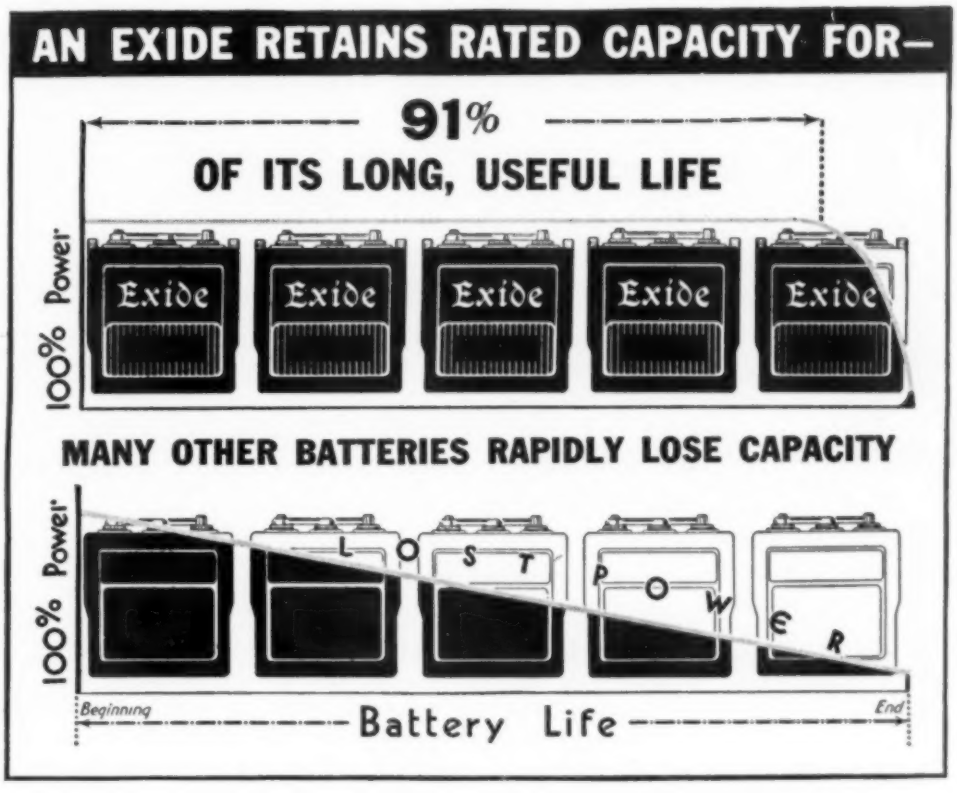
The rate of acceleration and braking, while always of interest to those engaged in transportation, has more recently been brought into general consideration by the use of the automobile. A speedometer merely indicates how fast a vehicle is moving in miles per hour. It shows increasing speed during acceleration, is steady at uniform speed, and decreases during braking. Beyond this it does not go, and rates of speeding up or slowing down must be obtained by a computation involving the distance travelled or the time consumed. Furthermore, some transportation vehicles are not equipped with speedometers.

The meter developed by Mr. Potter utilizes the inertia of a mass, requires no calculation, and not only indicates actual rates but any irregularities in the rate during acceleration or braking. It features a glass tube bent in the shape of a rectangle and partially filled with mercury. This is mounted on a flat base so that the meter may rest on a window sill, parallel to the vehicle's direction of travel. The glass column toward the rear of the vehicle is marked off in miles per hour per second above and below a central zero position. The front column, toward the head of the vehicle, is marked off in per cent grade, above and below a zero.

The inertia of the mercury in the horizontal position, which is in line with the direction of motion, causes a change in the mercury levels in the vertical columns, directly in proportion to the rate of acceleration or retardation. When the vehicle is at rest, or moving at a uniform speed, the reading in miles per hour per second is zero. The meter has two adjustable clamps, for fixing the zero position and to provide a damping effect.

Exides

GIVE LOWEST COST PER TRUCK MILE



THESE ARE DAYS to watch maintenance costs with an eagle eye. Truck operators who use Exide Batteries find maintenance simple and economical.

The chart on this page tells how Exides save money and do their work more efficiently. The battery that rapidly loses capacity, regardless of the initial cost, is expensive in the long run. When capacity dwindles, maintenance costs skyrocket. When you invest in Exides you're sure of getting dependable, economical service, long life, and plenty of power for the toughest jobs. And that means you get more for your money.

EXIDE ENGINEERING SERVICE

To help keep maintenance figures in line with present-day operating policies, we have an established Battery Engineering Service. This Service, conducted by carefully trained and experienced battery engineers, is available to fleet operators. There is no charge made.

Exide BATTERIES

FOR EVERY TYPE TRUCK

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia

THE WORLD'S LARGEST MANUFACTURERS OF STORAGE BATTERIES FOR EVERY PURPOSE

Exide Batteries of Canada, Limited, Toronto

Say "I saw it in FLEET OWNER"—It Helps!

READER SAY-SO

(Picked at Random from The Editor's Mail-Bag)

Salesmen Read It, Too

"IT behooves me to tell you of the available acceptance that your publication enjoys with fleet owners. Because of the many and varied discussions which are handled in your magazine, FLEET OWNER, I am many times in a position to discuss in a first-hand manner, many problems which fleet operators are encountering. In view of this, I would appreciate having my name on your permanent list."—*G. R. Epps, Representing Skinner Motors, St. Louis, Mo.*

●

We'll Keep You on the List

"ENCLOSED is your questionnaire, properly filled out. We are very glad to receive your publication FLEET OWNER, as we obtain a great deal of useful information from it and hope you will continue to keep our name on your mailing list. We operate a fleet of 532 trucks."—*D. R. Boyer, Service Supt., Hathaway Bakeries, Inc., Cambridge, Mass.*

●

Thanks, Mr. Fassett

"I AM enclosing your latest Question-of-the-Month blank, filled out. I must acknowledge that FLEET OWNER is my favorite publication in the automotive line. More power to you! We operate a fleet of 24 trucks and 8 passenger cars."—*R. H. Fassett, Supt. Garage, El Paso Laundry & Cleaners, Inc., El Paso, Tex.*

●

We'll Try to Keep It Up!

"KEEP up the good work. Your FLEET OWNER is very instructive and is a fine publication for fleet operators."—*M. B. Harris, Supt., Miller & Rhoads Department Store, Richmond, Va., operating a fleet of 25 trucks and 18 passenger cars.*

"They Simply Go Wild"

"WE are having trouble with the liquid gasoline gauges on our service and company cars. They are not recording—they simply go wild. Any information you can give us will be appreciated. Your publication FLEET OWNER is appreciated in the operation of our fleet of 24 White trucks."—*W. H. Sievers, Treas., The H. O. Seiffert Co., Everett, Wash.*

(Editor's Note: We will take this matter up in our Trouble Shooters' Department soon, but in the meantime are sending you a bulletin that shows how to correct this type of gauge.)

●

Accountant Likes It

DEAR Mr. Fischer: "I have received many good ideas from your magazine, although my work is accounting. After I have finished reading FLEET OWNER the boys at the shop also get a chance to see it. From it they get many pointers regarding their line of work. We operate a fleet of 60 trucks and 4 passenger cars."—*Chas. F. Reuss, Nolde Brothers Wholesale Bakery, Richmond, Va.*

●

Two Bucks Is the Price

"I HAVE seen the May issue of FLEET OWNER and there was some very valuable information in it. If you will kindly advise me your subscription price for it, I will be glad to send you a check for same. I am a truck operator and think that it would benefit me to a great extent to receive this interesting publication."—*Bethea Truck Line, R. L. Bethea, New Hebron, Miss.*

Short and Sweet

"MANY thanks for continuing to send this splendid magazine, FLEET OWNER. We operate a fleet of 131 trucks."—*R. P. Smith, Supt., U. S. Post Office Garage, Norfolk, Va.*

●

Are You Following Us?

"ENCLOSED is a Question-of-the-Month blank, properly filled out. I think it would help all fleet operators to follow the information in the FLEET OWNER. We operate a fleet of 15 trucks, 6 passenger cars and 2 other vehicles."—*P. J. Shanahan, Service Mgr., J. P. O'Neil Coal Co., Somerville, Mass.*

●

"Interesting and Helpful"

DEAR Mr. Fischer: "The writer has been receiving your monthly publication, FLEET OWNER, and has found it to be very interesting and helpful to him in his daily work. As I spend considerable time away from the office, I would appreciate it very much if you would forward this publication to my home address."—*R. F. Rowe, Automotive Department, Wilson & Co., Chicago, Ill.*

●

He's a Regular Reader

"WE receive FLEET OWNER regularly in our truck garage and we find its contents very valuable."—*Henry F. Kelly, Mechanic, American Brass Company, Derby, Conn.*

●

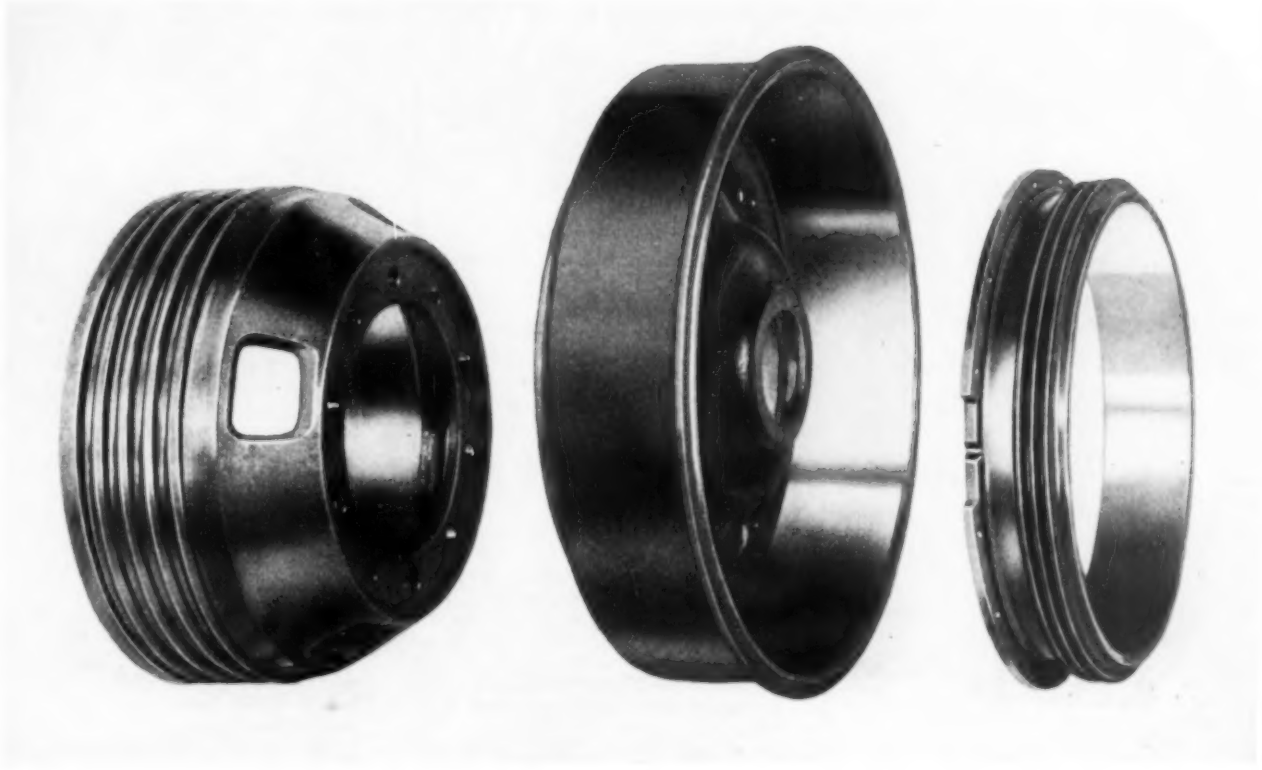
"Lot of Good Information"

"WE operate a fleet of 20 trucks, 1 trailer and 2 passenger cars in the transfer business and have received a lot of good information from FLEET OWNER."—*E. H. Schleunes, 420 W. Conway St., Baltimore, Md.*

THE WORLD'S FINEST

Guaranteed Quality Gun Iron Brake Drums

For White Trucks and Buses



No price premium on Guaranteed Quality Drums. Repeated comparative tests on White Trucks and Buses equipped with our gun iron drums show fewer failures, brake maintenance costs reduced, and all brakes more effective, regardless of lining or blocks you use. No distortion or scoring. The toughest and hardest brake drum made. Our prices to you average approximately 40% from list. EXAMPLE:

	White List	OUR NET TO YOU
D-4002 Rear Axle Brake Drum	$35.00	$21.00

Not one of your White Trucks or Buses can make Guaranteed Quality quit.

PITTSBURGH PARTS CORPORATION

SANDUSKY STREET • • • PITTSBURGH, PENNA

THE ONLY WHITE TRUCK REPLACEMENT PARTS SPECIALISTS IN AMERICA

Say "I saw it in FLEET OWNER"—It Helps!

120. **Acid Crankcase?** Well, the advertising men have given us one more disease to reckon with. This one really hits home, however, because unlike "Athlete's Foot" practically all of our engines are suffering from the disease in one stage or another. To make a long story longer, a new oil filter is on the market that is said to neutralize any crankcase acids through the use of a chemical filtering element. Of course, it is supposed to remove the solid matter, too, like all good oil filters. For further details you've got to unhook your fountain pen and put down No. 120 on our handy little coupon. A pencil will do, if you will.

●

121. **Simplified and Perfected.** That's what they're saying about a new system of air-actuated brakes for trucks, trailers and buses just developed. And it's not just the same old story in a new dress, unless we've missed our guess. It's something absolutely new. Who will be the first in your neck-of-the-woods to learn about this latest development? You will, if you mention No. 121 on our coupon.

●

122. **An Outstanding Truck Development.** That's what the makers say of their new line of four-wheel-drive trucks which you can now purchase at two-wheel-drive prices. There's also a line of six-wheelers in which *all* wheels are drive-wheels, and we understand that your Uncle Samuel is using a flock of these in the Army. As with all other items on this page, interesting literature is ready for you. Just fill in No. 122 on the coupon if you want it.

●

123. **Chock Full of Pictures.** If you want to get an idea of what the equipment of various fleet owners in different parts of the U. S. A. looks like, you'll find this "photograph album" mighty interesting. It pictures the equipment of over 50 different fleets—all in different lines of business—and all different makes of trucks, too. Besides all this, there is some interesting data with each picture, which relates savings made in fuel consumption—and, believe it or not, some of them were as high as 48%. Number 123 on the coupon below brings a copy of this elaborate book, entirely free, of course.

WHAT DO YOU READ?

HERE'S a hand-picked assortment of literature that is offered to you entirely without obligation.

We've even made it easy for you to get it. Fill in the coupon below, mail to the Editor, and let us do the work. We'll ask them to send it at once and not to bother you with salesmen, either.

124. **Know Your Batteries?** Most of you fleet men know your "Onions", but when you get your free copies of this Battery Manual, you'll agree with Brother Fischer when he says "You can always learn." Frankly, this is one of the most comprehensive storage battery manuals we have ever seen, and there's not a bit of advertising in it, either. Besides, it's not one of those technical books that treats with generalities. On the contrary, it takes up the subject of batteries from the fleet standpoint, in bus and truck service. And it's written in language that even your Editor can understand. Number 124 brings it and "nobody will ask you to buy nothin'" either.

●

125. **Important Information.** A pair of words that have been worked to death. Even our own advertising solicitors use them. This latest bit of data consists of a "Survey" made by independent engineers. It shows how governors save 80% of accident cost; 20% of gasoline cost; 46% of oil cost; 43% of repair cost; and 33% of tire cost. But don't attempt to add up the savings, or somebody will be owing you money. And it's not going to be us, if we can help it. No. 125 brings you a free copy of this "Survey."

●

126. **What a Lot of Friends.** When your Editor made a few remarks about the synthetic enamels he used on his boat this Spring (See p. 13, June issue) he said that "only his best friends would know the makes." Judging from the many letters we've received asking the make, he must have a host of friends. In order that we should not be accused of boosting any product, we'll just include a copy of the manufacturer's literature in this department. It's a book on the subject of "refinishing commercial vehicles." If you want a copy, put down Number 126. You'll find the book interesting and we'll let you guess how the paint worked out on the boat.

●

127. **Got Any Hydraulics?** Most fleets have some vehicles, at least, that are equipped with hydraulic brakes. They've been on the market a long time and a good maintenance man can undoubtedly lick any problems that might come up. However, it's good to have on file the latest "Hydraulic Brake Maintenance Manual", since it covers all types, including trucks and buses. And No. 127 on our coupon brings a copy free.

●

128. **A Guide to Savings, Too.** Although the title of this book is "A Guide to Profits in 1933", don't let the title prevent you from sending for it. We know that your maintenance department does not do service work "for profit" but you'll find the book, which is a valuable catalog on service parts for Fords and Chevrolets, of some interest. And maybe the prices will claim no small share of your attention, as well. Number 128 brings a free copy.

●

129. **Master Parts Catalog.** If you do any amount of engine rebuilding (and most fleet owners do their own) you'll find this new shop catalog a handy reference. It contains 176 pages of parts dimensions, stock numbers and replacement data covering all makes of cars, trucks and buses. If you want to know the make of engine used in certain equipment, the width of the piston rings, or the size of the main bearings, these are but a few of the things you'll be able to find at a glance. It's accuracy is a feature. List prices (if you want them) are published in a separate section of the book, loose-leaf, so that you can throw them away when they're out-of-date, or use them for shaving paper. Number 129, please.

NOTE:
Literature listed here is all "Hot Off the Press" and is guaranteed to be of interest to fleet maintenance men.—H. C. F.

The Editor, FLEET OWNER, ...1933
90 West St., New York, N. Y.

Kindly send me without obligation, the following free books mentioned in the.....issue. (Literature will not be sent unless firm name is given.) Order by number.

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....

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Firm Name .....

Address .....

City and State .....

Your Name .....Position .....

TREAT 'EM ROUGH—THEY LIKE IT

*GUARANTEE
Toledo "Type S" Super-Forged Valves are guaranteed. Your jobber will give you, without charge of any kind, a new valve in exchange for any Toledo "Type S" Super-Forged Valve which proves defective in service.

● Pounding away in the intense heat of the modern motor shows up ordinary valves, but it's "duck soup" for Toledo Super-Forged Valves—they're guaranteed to take it and come back for more. These tough, heat-resisting valves stand up and deliver satisfaction in the hardest service. Toledo's are *The Guaranteed Valves.* Install them by the set.

THE TOLEDO STEEL PRODUCTS COMPANY, TOLEDO, OHIO, U. S. A.

New York, 17 W. 60th Street » Chicago, 1225 South Wabash Avenue » Atlanta, 279 Ivy Street, N. E. Dallas, 2805 Commerce Street » Kansas City, 14th and Oak Streets » Los Angeles, 1341 South Hope Street » San Francisco, 528 Larkin Street » Portland, 408 N. W. 12th Avenue » *In Canada: The Toledo Steel Products Company, Ltd., 2-10 Breadalbane Street, Toronto*

TOLEDO

Say "I saw it in FLEET OWNER"—It Helps!

QUESTION of the MONTH

"By far, one of the most valuable departments to be found in any automotive publication. Every fleet man should be delighted to cooperate."—A Reader

Here are Some of the Most Interesting Replies to Question No. 34:

Armour & Company

"IN our fleet there are 200 refrigerated and 500 semi-insulated bodies. Both ice and dry-ice are used as refrigerants, depending on the temperature required—ice for high temperatures—dry-ice for low temperatures.

"Body insulations include both cork and Dry Zero—cork in floors—Dry-Zero in walls and roof. In the semi-insulated jobs hair insulation is used. Copper bearing auto sheet is used for the outside of these bodies, with Armco galvanized metal on the inside. Refrigerant is carried in wire mesh bunkers.

"We design our bodies; they are built both in production and by custom builders. We have not found that it pays us to use insulated bodies in cold weather to keep perishables from freezing, as we only carry packing house products. One of our problems is caused by the rapid deterioration of metal work due to the moisture that is present in the bodies."—*F. L. Faulkner, Armour & Company, Chicago, Ill., operating a fleet of* 3,025 *vehicles.*

●

Wilson & Company

"ABOUT 300 of our trucks are equipped with refrigerated bodies, for the transportation of fresh meats. Salt-and-ice is used as a refrigerant, as we are able to obtain the desired temperatures with this material at a very nominal cost.

"For the body insulation we use hair, which is the most satisfactory, as we have experienced no trouble with the insulation settling; no moisture troubles; in our opinion. it's superior to other types of insulation.

"On the outside of the bodies we use steel and aluminum. with yellow-pine on the inside. Refrigerant is kept in a wire basket. We design our own bodies; they are built by good reliable body builders throughout the country. We find that it pays to use insulated bodies in winter to keep perishables from freezing.

"We have had considerable experience with insulated truck bodies and have used various types of insulation. After a unmber of years we find that hair insulation is ideal for our purpose. It is our desire to carry the temperatures in our bodies from 40 to 50 degrees F. During the warm weather we experience no difficulty in retaining these temperatures."—*R. F. Rowe, Automotive Dept., Wilson & Co., Chicago, Ill., operating a fleet of* 2,050 *vehicles.*

●

Stahl-Meyer, Inc.

"FOR the transportation of meat products we are using 38 refrigerated bodies, using ice as the refrigerant. The ice is carried in Ice-Fin units. Dry Zero insulation is used, with Ply-Metal on the outside.

"We use some factory-built bodies, made by Fitzgibbon & Crisp. Our custom-built jobs are also designed and built by this company, under our supervision."—*H. Sunderman, Supt. Trans., Stahl-Meyer, Inc., New York City, Operating a fleet of* 150 *vehicles.*

●

Kroger Grocery & Baking Co.

"WE are using about 300 semi-insulated bodies and 6 refrigerated jobs at the present time. We have gone into refrigeration very extensively up to the present, only using it for bulk deliveries of fresh meats from our packing houses to our various distribution points. We are, however, using some insulation on our large type trailers for the hauling of fruits and vegetables.

"Ice is used as a refrigerant, in conjunction with salt, as we believe this is the positive method of hauling fresh meats at an even temperature. Dry Zero insulation is used, with aluminum and steel panels on the outside of the bodies, and steel panels on the inside. The ice is carried in galvanized corrugated bunkers. We design our own bodies, but they are built by various builders on a competitive basis.

"Our particular problem is the handling of perishable produce and meats on extremely long routes. Our semi-insulated bodies are very satisfactory as regards the prevention of freezing in cold weather.

"We are contemplating, in the very near future, adopting as standard equipment in all of our units, a much more efficient type of insulation, as we feel unquestionably that insulation and refrigeration are inevitable in the transporation of food products."—*F. O. Terril, Automotive Dept., Kroger Grocery & Baking Co., Cincinnati, Ohio, operating a fleet of* 800 *vehicles.*

●

General Ice Cream Corp.

"REFRIGATED bodies totaling 150 are used in our fleet; also 40 insulated bodies. We use mechanical refrigeration (some cartridge type). The mechanical type, to our minds, is most satisfactory. It is self-contained and we do not have to depend on non-controlable sources for refrigeration. The equipment can be transferred without any advance preparations.

"For the insulation in our bodies we use cork. It is natural insulant, easy to fit with less waste, and is easily repaired. We use metalwood on the outside of these bodies and Toncan metal on the inside. The refrigerant (mechanical) is carried in fin-coils from compressor.

"We design and build our own bodies in our own shops. We have been building our own bodies for seven years and prefer to do so, as we know exactly what material is used in their construction. We are constantly experimenting and making improvements and are perfectly satisfied with our present bodies."— *B. S. Snowden, Trans. Mgr., General Ice Cream Corp., Schenectady, N. Y., operating a fleet of* 1100 *trucks.*

HOW WE KEEP THEM COLD (*Continued*)

Whiting Milk Companies

"EIGHTEEN refrigerated bodies and eighteen insulated bodies are used in our fleet. Both dry-ice and mechanical refrigeration do the cooling. We find the dry ice units more dependable as the mechanical units give us considerable trouble. In our units we feel that the extra weight carried on the mechanical system is not profitable, as it requires larger trucks.

"Both cork and Dry Zero insulation materials are used. They perform about equally, but we prefer the latter, due to the weight factor. Galvanealed steel is used for the outside of our bodies; galvanized iron on the inside. The refrigerant is carried in galvanized bunkers, with copper plate.

"We do not use factory-built bodies; we design our own and some we build in our own shop. These jobs are used for the carrying of ice cream; milk is carried in insulated trailers. We find that it pays to use insulated bodies in winter, to keep the milk from freezing. In fact, our insulated panel delivery trucks, we have eliminated frozen milk and save ice as well.

"The dry-ice bodies are iced three hours before going out in the morning. The dry-ice is removed when the trucks come off the routes at night. This enables us to defrost every night and gives us good results."—*H. Weiner, Supt. Motor Trans., Whiting Milk Companies, Boston, Mass., operating a fleet of 340 trucks and passenger cars.*

●

Armour & Company

"EIGHTEEN refrigerated bodies are used in our Phildelphia fleet, for the transportation of packing house products. We use ice, carried in baffled screen bunkers at the front of the bodies. Apparently ice is the best refrigerant for our purpose (no salt), as there are no mechanical parts, a more even natural cool air in all seasons, and it is generally satisfactory.

"We use bodies of metal construction, inside and outside, with an insulation material of popular, patented type. The bodies are designed by our Chicago headquarters and built by local builders.

"We believe that if someone invents a refrigeration system, using the engine vacuum, it will find universal acceptance. As it is, the science is new and rather imperfect. Something 'new under the sun' is needed."—*Geo. Bryan, Garage Mgr., Armour & Co., Philadelphia, Pa., operating (at this branch) a fleet of 68 vehicles.*

(Please tear out and mail to The Editor, The Fleet Owner, 90 West St., New York City)

Question No. 36—Electrical System Failures

What are your most common electrical system troubles? (Please check)

☐ Burned-out lamps	☐ Contact point trouble	☐ Over-charged batteries
☐ Coil trouble	☐ Advance mechanism trouble	☐ Under-charged batteries
☐ Condenser trouble	☐ Starting motor trouble	☐ Shorts in wiring
☐ Generator trouble	☐ Starting switch trouble	☐ Spark plug failures

Others .....

Which of the above electrical units gives you the most trouble? .....

What have you done to correct and eliminate these troubles? .....

.....

Of your road failures, what percentage are due to electrical troubles? .....

Are any of your vehicles equipped with voltage regulators? ..... How many? .....

Do they perform satisfactorily? (Please explain your experience with them) .....

.....

In your opinion, should all commercial vehicles come equipped with voltage regulators? .....

How many (and what types) of your vehicles require a heavier-than-standard electrical capacity, such as extra lights on trailers or in busses, electric heaters, fans, etc? .....

Do you find standard equipment (battery and generator) adequate for same? .....

If not, what is done to provide sufficient electrical current? .....

.....

What are your most common battery troubles? .....

Is your electrical maintenance under the supervision of one man? ..... Is it divided? .....

What steps have you taken to increase his (or their) electrical knowledge? .....

Have you any suggestions to make regarding electrical equipment that would help to improve your electrical performance? .....

Remarks .....

.....

We operate ..... Trucks; ..... Buses; ..... Pass. Cars; ..... Other Vehicles

Note: If you cooperate with us and fill out this questionnaire, you will be entitled to a tabulated report covering all of the answers.

Swap your Maintenance experience with other fleet operators in this easy, convenient way. We do the work. You get the benefit.

Name of Firm .....

Address .....

City and State .....

Your name ..... *Position* .....

for ROAD *and* SHOP

Perfect Seal Gasket Paste

THIS product, a new gasket paste recently introduced by P.O.B. Mfg. Co., Cincinnati, Ohio, is claimed to be non-hardening, in spite of the fact that it sets instantly.

It will stand heat up to 400 degrees F., is leak-proof, pressure-proof and non-soluble, defying steam, gasoline, oil, anti-freeze, etc., according to the makers. It is also non-corrosive and rust-proof.

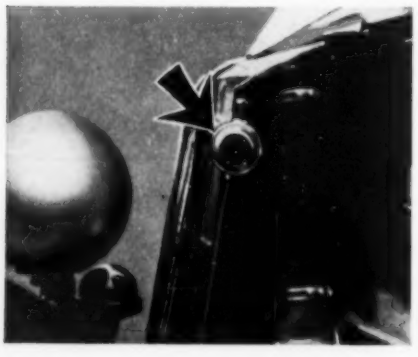
The manufacturers also declare that it is possible to use old gaskets over again, by simply applying a thin coating of this gasket paste to old (and new) gaskets.

A new booklet "How to Use Gasket Paste With or Without Gaskets" has just been issued and will be sent free, on application to the above firm. A liberal sample of the gasket paste itself will also be sent, if you want it, without obligation, of course.

•

Illsley Closed Radiation

THE chief feature of the Illsley System of closed radiation is the monitor valve illustrated here. This unit is designed for installation in the radiator over-flow line. It normally remains closed and thus prevents all ordinary loss of water or steam in summer, and anti-freeze in winter, according to the makers.

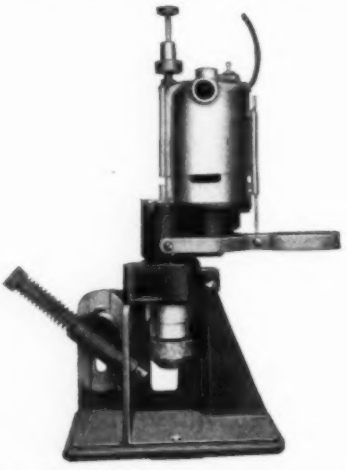


Should any abnormal condition develop, to cause boiling to the extent that venting is required, the monitor valve automatically opens to the required degree, and at the same time produces a whistling sound which notifies the driver. When the boiling condition is relieved, it automatically closes.

Models are now available for the heavy-duty field, including trucks, buses, road-building machinery and other units using water-cooled systems. Literature and other descriptive matter will be sent on request. Write to The Illsley Company, 38 Piquette Ave., Detroit, Mich., mentioning FLEET OWNER, please.

•

Eccentric Valve Seat Grinder



THE Model E-S valve seat grinder recently announced by the Hall Mfg. Co., illustrated here, is identical in principle with the eccentric type grinder used in production by many of the engine makers who have adopted hardened valve seats as standard equipment.

In this grinder, the fleet shop is provided with portable equipment capable of grinding a valve seat to production standards. The grinding wheel revolves at 8,500 r.p.m., while traveling eccentrically around the seat at a speed of 30 r.p.m.

Wheels are supplied in various grits for grinding cast iron, Stellite and alloy seats. Other equipment is provided for working on any type of valve seat, in various angles and for recessed or countersunk seats as well.

Two models of this grinder cover all valves, from the smallest to 4½" diameter seats. Other models are made for airplane and Diesel motors. Complete details will be furnished by Hall Mfg. Co., Toledo, Ohio. Sold through jobbers.

•

Portable Electric Blowers

A LINE of portable electric blowers is offered by Clements Manufacturing Company, for various industrial uses. These blowers are designed to furnish a large volume of air at high velocity, yet at comparatively low air pressure. Air delivered is dry and free of all condensed moisture. Attachments are available to instantly convert these blowers to suction cleaners, for such work as cleaning dust out of parts stock bins, etc.

As blowers, they are particularly adaptable to cleaning out dust from armatures of electric motors and generators, cleaning ovens in bakeries, textile machinery, laundry equipment, and similar places where dirt is deeply imbedded and difficult to reach. They are also useful in woodworking plants, to remove dust from planers and sanders—in fact any equipment which must be kept dust-free to operate economically.

Attachments are also available for insecticide spraying and paint spraying. A blow-torch attachment can also be supplied, for such operations as welding, annealing, brazing, soldering, bending, etc., using city gas.

Interesting circular that illustrates and describes this line of versatile equipment can be obtained from Clements Mfg. Co., 90 West St., New York City.

Slick-Up Cuts Paint Costs

(*Continued from page* 14)

through this publication, on the subject of commercial vehicle refinishing. The Editor will be glad to see that your request is taken care of promptly, without obligation. Just drop us a line and ask for "Literature on the new Commercial Vehicle Finishes." It's free for the asking.

●

We Design a Package Car

(*Continued from page* 22)

to its particular use. Our company has approximately 1,200 delivery cars in operation; the combined sales volume of all the stores it serves exceeds $400,000,000 a year, which means that the United Parcel Service handles a large number of packages daily, around 75,000 on ordinary days and far beyond that during heavy selling seasons.

The new bodies have been built in two sizes, one for a half-ton job, mounted on a 112-inch Ford pleasure chassis, with 4-cyl. commercial car engine; the other for a 1½-ton job, on a 131-inch chassis. The half-ton job has a capacity of 150 cubic feet. Its loading space is 6 ft. long, 68 inches wide and 64 inches high. The well is 21 inches from the rear door. The 1½-ton job has 250 cubic feet capacity with the body width and height the same as the one-half ton job but with 9 ft. 6 inches loading space behind the driver's seat.

Both cars have black fabric upper half, and a lower panel of metal painted with the company's conventional chocolate brown, with highly polished surface. The floor boards in the driver's compartment are of ⅛-inch aluminum plate which furnishes lightness, durability and also clean, neat appearance.

These experimental cars are now in use in the New York division of our company and after trying them out in the various sections of that territory, they will be shipped West for tryout in Los Angeles, San Francisco, Oakland, Portland and Seattle. In this way the management of each of our Company's main divisions will have an opportunity to determine whether the new design is to its liking. If the cars prove generally satisfactory they will be adopted as standard equipment throughout the United Parcel Service system.

●

Stop Wasting Fuel

(*Continued from page* 26)

Bus Company is a 23% cut in gasoline costs on one of their buses operating between Chicago and St. Louis.

The Willett Company of Chicago, operators of 450 buses and trucks reports that 70,000 gallons of gasolene have been saved since adopting Power Prover service.

The W. T. Rawleigh Company of Freeport, Ill., reports a 10% reduction in maintenance costs while the Junge Baking Company of Joplin, Mo., eliminated the dangers of contamination of baked products, in addition to reducing gasolene costs 10% and oil costs 70%.

These are only a few examples picked at random of the savings which exhaust gas analysis is opening up to the fleet operator.

The illustrations accompanying this article include but a few more of the many large fleet operators who

(*Please turn to page* 42)

For all loads
under all conditions...

TIMKEN
FOUR-WHEEL UNITS

SIX-WHEEL vehicles—made possible by four-wheel units—have pulled many a commercial operator out of the red; are really paying their freight. They're a sensible solution to modern hauling problems.

Six-wheelers divide the weight equally. You can load *every wheel* to the maximum legal limit—that means more pay load for the same gross weight. They're adaptable—two-wheel drive for level roads; four-wheel drive for hilly country or unpaved roads. You can use them alone or pulling trailers.

Timken offers you a complete line of four-wheel units in all sizes and types. Quality is Timken throughout . . . which means perfectly engineered, correct equipment. Driving axles may be bevel, worm or double-reduction. Auxiliary axles of the famous Timken tubular design.

Consult Timken about these units—it may result in a big change in the color of your final balance.

THE TIMKEN-DETROIT AXLE COMPANY
Detroit, Michigan

TIMKEN AXLES

Keep 'Em on the Road

The truck operator must keep his trucks moving with as few stops for repairs as possible if profits are to be realized.

UTILITY Six-Wheel

Attachments put on four wheel trucks help keep the trucks moving regularly and with capacity payload . . . BECAUSE

These attachments diminish the strain of heavy loads on the entire chassis, and particularly on the drive axle, wheels, and tires. Repair and upkeep costs are reduced. There is better opportunity for profit.

UTILITY Distributors

are in nearly all important cities, and we invite you to consult with them about these money-saving attachments for your four-wheel trucks. Ask for definite figures on savings. They are available.

BUFFALO—Frey, The Wheelman, Inc., 520 Ellicott St.
CAMBRIDGE—Perin-Walsh Company, Fifth & Bent Sts.
CHICAGO—Schukraft & Company, 1201 Washington Blvd.
CLEVELAND—Truck Engineering Corp'n, 1802 East 38th St.
COUNCIL BLUFFS—Omaha Standard Body Corp'n, 2411 West Broadway.
EL PASO—Walter Pofahl, 620 Texas St.
FRESNO—Utility Trailer Sales Co., 630 "R" St.
HONOLULU—Schuman Carriage Co., Box 2281 Honolulu.
INDIANAPOLIS—Indiana Wheel & Rim Co., 34 West North St.
KANSAS CITY—National Steel Products Co., 1611 Crystal Ave.
LOS ANGELES—Utility Trailer Sales Co., 1600 South San Pedro St.
NEW YORK CITY—Metropolitan Truck Equipment Corp'n, Long Island City, Third St. & West Ave.
OKLAHOMA CITY—Leland Equipment Co-Branch, 1637 West Main St.
PHILADELPHIA—United Wheel & Rim Service, Inc., 1412 Fairmount Ave.
PHOENIX—Paul Bennett, Cor. 2nd Ave. and Van Buren.
PORTLAND—Murry-Jacobs Co., 146 North Sixth St.
RICHMOND—Baker Equipment Engineering Co., Summit & Rockbridge Sts.
SACRAMENTO—Utility Trailer Sales Co., 440 North 16th St.
SALT LAKE CITY—The Lang Co., 267 West First South.
SAN ANTONIO—San Antonio Body Co., Inc., 823 Roosevelt Ave.
SAN FRANCISCO—Utility Trailer Sales Co., 1242 Mission Street.
SEATTLE—Murry-Jacobs Co., 528 First Avenue South.
ST. LOUIS—The Herman Body Company, 4420 Clayton Ave.
SPOKANE—General Machinery Co., East 3500 Block, Riverside Avenue.
TULSA—Leland Equipment Co., 515 West Archer St.
WASHINGTON, D. C.—Washington Equipment Corp'n., 1003 Wisconsin Ave., N. W.

UTILITY TRAILER MFG. CO.
P. O. Box 1407, Arcade Annex,
Los Angeles, Calif.

An Attachment for Every Size Truck

Stop Wasting Fuel

(*Continued from page* 41)

have taken advantage of Power Prover Service. There is no cost for this service and the Power Prover itself is not sold, either. Interested operators can arrange to have a demonstration made, entirely without obligation, by writing to Cities Service Power Prover, Room 702, 60 Wall Street, New York City. The Editor will be glad to arrange this for you, if you prefer.

●

Do They Get Hot?

(*Continued from page* 28)

motors is "unnecessary" in the sense that it is caused less by genuine overheating, than by external conditions such as are listed in the display box accompanying this article.

EDITOR'S NOTE: The author of this article is an ardent advocate of closed radiation for automotive engines, which means that by preventing the usual water loss from the overflow, and by maintaining the rest of the cooling system free from leaks, water consumption can be reduced to so small an amount that the use of distilled water can be made economically possible. Runs, also, can be scheduled from terminal to terminal without replenishing en route, or to points as high as 1,000 miles or more apart, where good water is available. Working along these lines, the author has developed a unit for installation in the radiator overflow line, which, when installed, normally remains closed and thus prevents (it is claimed) all ordinary loss of water or steam in summer, and costly anti-freeze in winter. We don't know anything more about this device, other than the description which we have given it in our "Road and Shop" department in this issue. After you have read the description of the unit, and if you are interested further, the Editor will be glad to put you into touch with Mr. Illsley, so that you will have the opportunity of acquainting yourself further with it. There will be no obligation, of course. Aside from any advertising value, we think the "24 Overheating Causes" as presented by the author, are quite thorough and timely, don't you?—H. C. F.

●

Free Slide Rule Shows Carrying Capacity

BASED on the inter-relationships between controling factors of truck performance, a slide rule copyrighted by the Reo Motor Car Company and supplied to fleet operators, is said to indicate instantly the proper or safe economical load carrying capacity, hill climbing ability and speed for any truck for which specifications are known.

Engine power or torque, axle and transmission gear ratios, and tire sizes all receive proper consideration. One side of the slide rule, which is of convenient pocket size, is printed in black and is used for determining load-pulling and grade-climbing ability. The other, printed in red, is used for speed calculations. Reo officials are confident that this device, by determining the fitness of a truck already in service to satisfy any given hauling requirements and by aiding in selection of new equipment suited to the needs, will help operators to effect hauling economies.

(If you have not as yet received your slide-rule, just drop a line to the Editor, and one will be sent you immediately without obligation of any kind. First come, first served.—H. C. F.)

Utility Trailer Co. in New Field

ANNOUNCEMENT is made, by H. C. Bennett, general manager of the Utility Trailer Mfg. Co., of the purchase by his concern of the plant and equipment of the Electric Steel Casting Company, located at 3334 E. Slauson Ave., Los Angeles, Calif.

This plant, which was built in 1926 at a cost of over $200,000, is now in operation under the new ownership, in the manufacture of the highest grade electric steel castings. Castings necessary in the production schedules of the Utility Trailer Manufacturing Company for the Utility trailers and six-wheel attachments will be produced in the Slauson Avenue plant, which will now be known as the Utility Electric Steel Foundry. In addition, the firm will do a general commercial electric steel casting business.

Foundry buildings cover 35,000 square feet in a tract of six acres. In addition to the main foundry which houses the electric melting furnaces, electrically heated core oven with automatic heating control, annealing furnaces and complete modern equipment for the production of electric steel castings, there is a pattern shop, a chemical laboratory and office building. As progress is made, it is contemplated the foundry will employ approximately 100 men.

●

Some Interesting Cost Figures

IN stresing economy of operation, President W. H. Beal of the Auburn Automobile Company points out that the upkeep of a fleet of 100-horsepower, straight-eight Auburns in service of American Airways is only eight-tenths of one cent per passenger per mile.

"American Airways now uses thirty-one cars for ground transportation between airports and business districts," said Mr. Beal. "Fifteen of them have been in service for the past ten months, and have been driven 233,435 miles in that period. The airline found that the cost per car per mile was: gasoline and oil, $.018; maintenance, including tires, overhauls, replacement of parts, etc., $.014, and depreciation on the basis of 33⅓ per cent per year, $.024.

"Those items total $.056. Because seven-passenger cars are used, one-seventh of that figure, or eight-tenths of one cent, is the cost per passenger per mile.

"No insurance nor garage rent is included for the reason that those costs vary greatly in different localities. The figures do include, however, the purchase price and all expenses incidental to the actual operation of the cars.

"The low costs become even more remarkable when it is considered that these are not new, but rather are in their third year of operation, and that the airline imposes strenuous service upon them"

PERFECT SEAL GASKET PASTE Challenges Comparison

SALES spurt ahead of all Expectations

FLEET owners who have started using Perfect Seal on all gaskets, new and old, tell us it reduces their gasket bills 90 per cent. The Reason? . . . . . They are using the gaskets (new and old) over and over again instead of continually buying new gaskets. These fleet operators now INSIST ON PERFECT SEAL.

You Can Make the Same Saving

THAT'S not all . . . . . You will find that jobs on which Perfect Seal is used will stand up longer and better than ordinary motor jobs. It equals thick shellac but is non-hardening, non-injurious to pistons, cylinders, and valves . . . . . Non-corrosive, non-oxidizing . . . . . resists heat up to 400° F., and is rust proof and non-soluble.

It Will Pay You to be Convinced

P.O.B. Manufacturing Co. Inc.
Cincinnati, Ohio.

Free Sample

Please send liberal FREE sample of PERFECT SEAL GASKET PASTE.

Name .....

Address .....

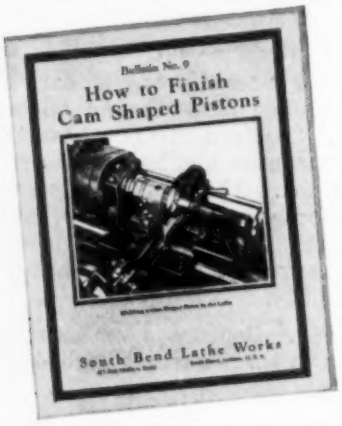
Favorite Jobber .....

Say "I saw it in FLEET OWNER"—It Helps!

NEW STUFF *for* ROAD *and* SHOP (*Continued*)

How to Finish Cam-Shaped Pistons

THE story of why pistons are now being made and finished cam-shaped and how they can be finished in the fleet repair shops is told in an interesting booklet now being offered by the South Bend Lathe Works.



In addition to showing how the new pistons can be finished to any contour or cam-relief desired, the booklet illustrates, describes and prices the three sizes of piston finishing lathes available. These lathes can be used to finish pistons either round or cam-shaped and also can be used for general machining and grinding work.

A copy of the booklet, called Bulletin No. 9, will be mailed to any reader on request to the Editor, or by writing direct to the Technical Service Dept., South Bend Lathe Works, South Bend, Indiana, mentioning the name of this publication.

●

Hall Cylinder Reborer

A RECENT product of the Hall Mfg. Co., Toledo, Ohio, is the portable reboring machine illustrated here, in which the best features of previous models have been retained, it is said.

A new and more accurate 6-blade cutter head is featured. The bar can be set for any boring depth up to 14 inches; when the bore is completed, it stops automatically.

Normal range of the machine is from 2⅝" bores to 4" bores. An additional cutter head will take care of cylinders up to 4¾" in diameter.

For new low price and complete details, address Hall Mfg. Co., Toledo, Ohio, mentioning FLEET OWNER, please.

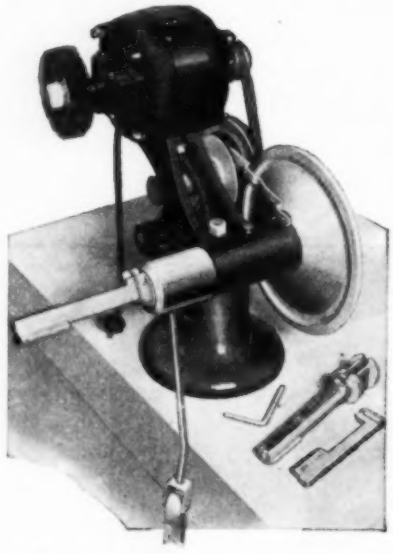
●

Hydraulic Brake Cylinder Grinder

TO their line of service equipment, the Sunnen Products Company has added a new motor-driven grinder for hydraulic brake cylinders. This tool, with two mandrels and an extension will grind and polish any hydraulic brake wheel or motor cylinder from 1.000" to 2.125".

It is claimed to be accurate within ten-thousandths and to produce a perfect surface free from high spots. According to the manufacturer it will remove from 2 to 5 thousandths per minute.

For fleet owners, this tool can be converted into a several-purpose grinder to handle piston pin holes,



spindle bolt bushings, steering sector housings, cluster gears, etc., by the addition of a set of mandrels and a pin fitting gauge. The Sunnen Products Company, 7919 Manchester Ave., will gladly send literature describing this new grinder.

●

Do You Use Wheelbarrows?

AND now it's low pressure rubber tires not only for airplanes, automobiles and trucks but for wheelbarrows as well. Engineers of The B. F. Goodrich Company, Akron, Ohio, have designed low pressure tires for wheelbarrows, they announce.

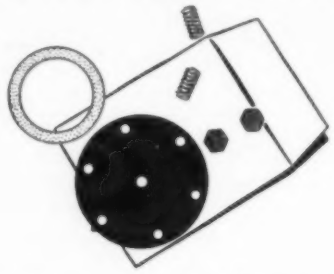
The new tires, patterned after airplane casings, constitute one of the few major changes made in wheelbarrow construction in many years. With low pressure tire equipment, it is possible to use wheelbarrows in mud and deep sand where the old type wheels found motion difficult if not impossible.

Manual effort required to push a wheelbarrow is considerably reduced when low pressure tires are used, Goodrich tests showed. Breakage, in many industries where this is a major problem, is also greatly reduced by use of rubber tired equipment.

●

AC Fuel-Pump Service Kit

TWO new fuel-pump diaphragm kits for servicing large and small sized AC fuel-pumps, are announced by AC Spark Plug Company, Flint, Mich.



At the same time AC announces that the fuel-pump kits, genuine AC fuel-pump parts and speedometer cables will be merchandised through all AC service and AC jobber outlets.

Approximately 9,000,000 cars are equipped with AC fuel-pumps and even more than this are using AC speedometers, Wilson S. Isherwood, AC general sales manager, said.

The fuel-pump diaphragm kits contain a genuine AC diaphragm and the necessary valves, valve springs and cork gasket required for servicing a fuel-pump.

●

Concentric Valve Seat Grinder

THE Model C grinder shown here was developed to meet the demand for a low-priced valve seat grinder that would do good work. It makes full seat contact and can be used to grind both cast iron and hard steel seats.

A micrometer limit stop makes it possible to set the grinder to remove the few thousandths necessary to clean up the seat without over-widening it. For full details and price write to Hall Mfg. Co., Toledo, Ohio, mentioning this publication, please. Sold through jobbers.

Wilson & Co. Wins Safety Award

COMPETING among 79 motor trucks of other meat packers in the Chicago territory, the Wilson & Co. plant fleet has won the Annual Safety Award for the third consecutive year. Reports issued by the Chicago Safety Council for the last 12 month period stated that the winners in the 22 groups, comprising all industries with 7,615 trucks operating, traveled 89,413,536 miles during the year.

The trophy for company chauffeurs being the most careful drivers is an engraved bronze plaque with the lettering:

"Fourth Annual Interfleet Drivers' Safety Contest Group Winner, Chicago Safety Council, Awarded to Wilson & Co."

Aside from this recognition of safe-driving, the Wilson & Co. chauffeurs who have achieved creditable driving records, have been the recipients of company awards during the 12-month period.

●

"Guide to Lubrication" in Second Edition

SPECIALIZED lubrication has been such a live subject during the past year that CHEK-CHART has found it necessary to get out a second edition of the book, "Service Man's Guide to Automotive Lubrication." This has been revised, many parts completely re-written and brought up-to-date, especially as to the progress of free-wheeling and free-wheeling lubrication. Many new illustrations have been added and the subject matter has been gone over by a number of prominent automotive and petroleum engineers so that as it stands, it is the last word in correct specialized lubrication practice in keeping with the modern trend of automobile design and modern methods of automobile lubrication.

Subjects covered include the entire range of lubrication of all parts of the automobile with a complete discussion of various types of lubricants, motor oils, their uses, applications and methods of servicing. Much valuable information is to be gained from a study of the book and several oil companies have adopted it as a standard text book from which they issue examination questions and grade the answers for future information in selecting men for better positions.

The book consists of 131 pages with 109 especially made illustrations, most of which have been specifically drawn to illustrate lubrication principles and have never appeared in any form before.

Price is $2.00 in the United States, ($3.00 in Canada). Published by The Chek-Chart Corporation, and available through the Book Department, Ferguson Publishing Co., 90 West St., New York City.

●

DATES for the National Automobile Shows have been designated as follows: The New York Show will be held at the Grand Central Palace from January 6th to 13th. The Chicago Show, at the Coliseum, will be held January 27th to February 3rd. Spaces at both New York and Chicago have been enlarged, making it possible for exhibitors to display more models and merchandise than heretofore.

●

AS this issues goes to press, the S. A. E. International Automotive Engineering Congress is being held in Chicago. It includes the Summer, Production, Transportation and Aeronautic Meetings of the Society. Interesting papers on automotive transportation problems are being presented. We hope to present abstracts from some of them, in an early issue.

Using as little as 2½ drums of oil monthly

You save hundreds of dollars annually with this SKINNER OIL RECLAIMER . . .

If you are using more, your savings increase accordingly. Many of the hundreds of present Skinner users save thousands yearly in oil purchases alone. In addition to these cash savings, a Skinner makes economically possible those definite steps that reduce your engine maintenance to a minimum. The initial cost of new oil becomes a secondary consideration to obtaining the best lubricants for your equipment—Also, frequent oil changes likewise become an economy instead of a waste. While thinking about it, return the handy coupon below that will bring, without obligation, dollars and cents figures and facts of what you can accomplish with a Skinner in your garage.

Skinner Motors, Incorporated
2229 DALZELLE STREET, DETROIT, MICH.

SKINNER MOTORS, INC., Pioneers in Oil Reclamation
2229 Dalzelle Street, Detroit, Michigan

Please tell us definitely with facts and dollar-and-cents figures, what a Skinner Reclaimer will save us in cash and oil.

We purchase approx. _____ gals. of oil per month
We drain approx. _____ gals. of oil per month
We pay _____ per gal. of oil
Our electric current rate is _____ per kilowatt hour
Signed _____ 9-33

MARMON-HERRINGTON

ALL WHEEL DRIVE

World's Most Advanced All-Wheel-Drive Trucks

$2250 and Upward, f. o. b. Factory; 21 Models; 1½ Tons and Upward

Write for Facts

Marmon-Herrington Co., Inc.
Indianapolis, Indiana

KRAMER *Certified* cooling **RADIATORS** *for* TRUCKS BUSSES and TRACTORS

OVALTUBE TUBULAR and TURBO CELLULAR CORES

Complete Radiators

TRENTON AUTO RADIATOR WORKS
Trenton, New Jersey

A complete line of superior quality axle shafts for all makes and models of passenger cars, trucks and buses. A special engineering service to study your individual problems is available to all responsible fleet operators.

Write for complete information

The U. S. Axle Co. Inc., Pottstown, Pa. U.S.A.

These delays STARE out at you

Here's a *two-hour "leak"! (Wasted time)*

A truck can easily waste $500.00 a year! The little *Servis Recorder* "points out" all idle time, on its chart. Stop all these "profit leaks". Make 4 trucks do the work of 5. Our new folder tells you how. Write for it.

Stop them with
THE SERVIS RECORDER

THE SERVICE RECORDER CO.,
Cleveland, O.

Western Truck-Freight System Formed

EMBRACING one of the most comprehensive motor truck freight transportation systems in the west, the Cal-Tex Transport Systems, under the management of Obert J. Egerer, president of the company, have compiled and issued a local joint freight tariff, effective August first, naming class and commodity rates between California and New Mexico, Texas, Oklahoma, Arkansas and Louisiana; with interline connections as described in the territorial description of the following groups: D: Chicago and points in Illinois east of the Mississippi river; E: Mississippi river points, St. Louis, Memphis, New Orleans and points east of Missouri river in Iowa and Missouri; also to Arkansas and Louisiana; F: Points on Missouri river, namely: Kansas City and south to Texarkana, Shreveport, Beaumont, Houston and points between; G: Kansas points; H: Oklahoma and Texas points west; I: Texas points, Quanah, Sweetwater, San Angelo, Del Rio and west, including Hobbs and Lovington, New Mexico; J: Colorado and points in Denver.

All rates include store door pick-up and delivery within defined city limits. Cargo insurance is carried on each piece of equipment also insurance covering property damage and public liability. C. O. D. bonds have been filed in each state served by the line haul.

The company is registered with the Los Angeles Board of Public Utilities, the Arizona Corporation Commission, the Railroad Commission of California and Texas and also has a certificate of registration in New Mexico.

The Los Angeles terminal is located at 5201 South Riverside Drive; the company has also established a terminal at 230 South Church Street, Las Cruces, New Mexico with interline terminals at San Antonio, Amarillo and Dallas, Texas.

•

DESIGNED especially to supply the demand for an air-cooled engine in the compressor, truck, tractor and general industrial field, a new six-cylinder power plant, developing 104 brake h.p. at 2,600 r.p.m., with a 4" bore and 5" stroke, has just been announced by Doman & Marks, automotive engineers, 101 Court St., Syracuse, N. Y. These two gentlemen were formerly Franklin engineers; their new engine should prove of interest in the transportation field.

•

A NEW product called "Pento" has been developed, that is claimed to be a non-poisonous, anti-carbon fuel energizer. "It is an organic, liquid compound which, when added to plain gasoline in minute quantities, has the effect of causing more oxygen to be absorbed by the fuel as it passes through the carburetor, thus promoting full combustion and increasing the efficiency of the engine," the makers state. Fleet owners in the East are testing this out at present and full information will be supplied by Pento Products Corp., 254 Front St., New York City, without obligation.

•

W. C. HARRIS has been appointed assistant engineer of the Transportation Department, General Electric Co., Erie, Pa., according to a recent announcement. Following the appointment of Mr. Harris, the automotive division of the transportation engineering department has been combined with the motor division, under the general direction of M. R. Hanna.

FURTHER diversification of its line, to meet specific needs in various trucking fields, is announced by General Motors Truck Company, Pontiac, Mich., which is introducing two modifications of existing models in the medium-duty class—one an option of Model T-33 and the other of Model T-43. The first named option, designated as Model T-33L, has a straight rating of 12,500 lbs., with recommended body and payload weights ranging from 5,080 to 7,870 lbs. The other, Model T-43T, has been designed strictly as a tractor unit, with straight rating of 16,000 lbs. and combined gross weight for tractor and semi-trailer recommended at 29,200 lbs.

•

DESIGNED by the Four Wheel Drive Company. Clintonville, Wis., the FWD rail bus has been recently introduced. It is 30 ft. long, 7 ft. 7 in. wide and has accommodations for 35 passengers as a standard day coach. It is driven by two 86 h.p. motors and can attain a speed of 70 m.p.h. or more. Each axle (front and rear) is driven by a separate motor, through a separate 3-speed transmission. Controls are synchronized, of course, through a single set of levers in the operator's compartment. Either drive unit can be shifted into neutral. Axles, each having one wheel at each end, are of the full-floating, automotive type, with conventional differentials.

•

ONE of the interesting vehicles exhibited in the dome of the Travel and Transport Building at "A Century of Progress" consists of an International Harvester Model A-8 tractor and Fruehauf semi-trailer unit. The body is completely paneled in Plymetl, and has a moulded Plymetl rounded front, typical for this type of tractor. It is a deluxe "warehouseman's van," 22 feet long, 8 feet wide and 11½ feet high, with full length double rear doors and a hinged curb side door. The rear corners are also rounded. The capacity of the trailer is about 24,000 pounds, maximum payload with body. Haskelite Mfg. Corp., 208 W. Washington St., Chicago, Ill., will be glad to send you the details. Or, you can write to International or Fruehauf.

•

A BULLETIN containing many interesting "Questions and Answers on Diesel Engines" has just been brought out by Cummins Engine Company, Columbus, Ind. It should prove of interest, inasmuch as it covers the subject in a general way and includes pretty well the methods used in practically all types of Diesels. A free copy will be sent on request if you mention this publication.

•

STEADILY increasing business has made necessary a general enlargement of the capacity of the American Brakeblock Corporation's factory at Detroit, Mich. Extensive changes in the plant have facilitated production and provided greater stock accommodations and better shipping facilities. A new production line for making Brakeblok lining in rolls has been instituted, together with a modern overhead conveyor system. Thus far in 1933, it is reported, sales of this material have been much greater than in any previous year. Distribution is such that the product is now available in practically every territory in the country.

ARMORPLY
A SUPERIOR METAL FACED PLYWOOD PANEL FOR BODY CONSTRUCTION
Write for samples and prices
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MOLDED IN ROLLS
Combines in one lining the best features of all types: is woven,—molded—compressed—baked. Dissipates heat faster, has higher stopping power, for it contains far more compound, far less asbestos. Holds its firm soft pedal. Reduces scoring, pedal fade, adjustments and squeaks. Will give long and superior service.
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The New Van Norman Jumbo Stud Puller gets 'em out quick and easy. Drop it over a stud and turn it with a wrench,—no resetting, no undue breakage, no unnecessary marking.

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A new edition is just off the press. It covers everything from wiring to armature rewinding. Takes up generators, starters, cutouts and regulators on all cars, trucks, busses and airplanes. Contains scores of test kinks that will be found handy in the shop. Explains test bench construction; takes up flat rates; in fact anything electrical in the automotive game.

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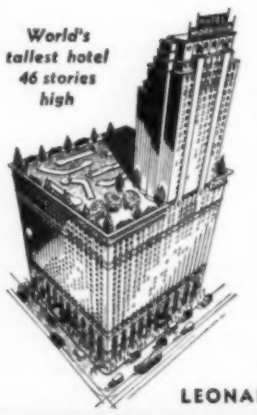

Stay at the Morrison when you visit the Chicago World's Fair of 1933. The Morrison Hotel is an outstanding example of the progress of invention and industry displayed in A Century of Progress. Perfectly located in the "heart of the Loop," everything worth while is nearby —theaters, shops, railroad stations. All rooms are outside with bath, Servidor, bed-head reading lamp and circulating ice-water. Reasonable rates — Garage facilities — Special floor reserved for ladies.

A great hotel in a great city!

2500 ROOMS — $2.50 UP

LEONARD HICKS, *Managing Director*

MORRISON HOTEL

Madison and Clark Streets, CHICAGO

Mr. President:

DOES your Financial Statement show a Deficit? Are your Truck Deliveries causing part of this Deficit?

If so, you need a Man who can cut your Trucking Costs to a Minimum! The day is past when a Mechanic can supervise a Fleet costing thousands of dollars.

Each Fleet needs an Executive who can analyze the complicated problems of Cost Accounting, Taxation, Personnel and Sales Cooperation. He must be familiar with the latest practice in Maintenance and Operation and the modern high components of today's Transportation requirements.

Such a man is now available and would like to have the opportunity of discussing this problem with you. Strict confidence will be appreciated and respected. Address Box 815, c/o Editor, FLEET OWNER, 90 West Street, New York, N. Y.

IMPORTANT developments have taken place with respect to the Motor Vehicle Conference of the 17 Northeastern states called by the Pennsylvania legislature to be held in Harrisburg, October 20 and 21st. The first session of this Conference will be devoted to an open meeting conducted along the lines of a legislative hearing. During this first session, truck and bus operators and competing forms of transportation will be given a chance to be heard. A Conference of 11 Western states will meet in Salt Lake City following the Harrisburg meeting.

•

POSITION WANTED. Experienced Salesman desires line to sell to fleet owners and automotive parts buyers. Acquainted with bus and truck trade, also wholesale buyers of machinery, tools and supplies, in the Central and Western territory. References furnished. Reasonable compensation. Address W. R., c/o FLEET OWNER, 90 West St., New York City.

•

APPOINTMENT of Hugh S. Cole, a veteran of the Bendix service department, as Chief Instructor of the Bendix Service School, has been announced by the Bendix Products Corporation, Service Division, South Bend, Ind. Mr. Cole joined the Bendix service department in 1926 and spent many years in the field, helping service operators and distributors iron out many knotty problems. The Bendix Service School is free to any legitimate service employee in the country—fleet maintenance men included.

•

Value When You Go To PHILADELPHIA

600 ROOMS 600 BATHS

A ROOM and A BATH For TWO and A HALF

$2.50 SINGLE WITH BATH $4.00 DOUBLE WITH BATH

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Just pin this ad to your letterhead and write make and model of truck. We'll send the governor. Give it every test. See how it saves, gas, oil, tires, brakes, motors, and adds years to the life of equipment. If after 30 days you are not convinced that CHICAGO GOVERNORS will double your net operating profit, send it back.

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Save

20% Gasoline
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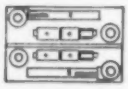
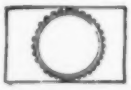
Water Pumps and Parts with the "Wear-Proof Chrome Shell" for Ford and Chevrolet. Twice the usual life in all parts, need half the adjustments. Wear, corrosion and rust resistant.



King Pins in Matched sets for 85% of all cars on the road. Ground *after* hardening to give longer *safe* wear, a perfect fit. Packed in new metal edged boxes, Ford sets in twin boxes of right and left sets.



Bates Starter Gears for all cars, both hardened and unhardened types. Set a standard years ago that hasn't yet been equalled.

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WOHLERT parts are built to *beat* the average standards, not just equal them. They set a *new* standard, the same standard as you do for your own work. You turn out the best possible job, so does WOHLERT.

Standard in that they are perfectly interchangeable with original equipment, WOHLERT parts are "Super-Standard" in that they incorporate the latest discoveries of metallurgists and engineers, making the famous WOHLERT Extra Quality Features.

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Successor to BATES WOHLERT CO. LANSING, MICHIGAN

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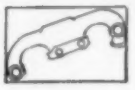
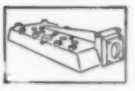


Chrome Nickel Cylinder Heads for Ford, Chevrolet, Plymouth, Pontiac, Willys, Intake and Exhaust Manifolds; Clutch, Flywheel and Transmission Housings for Ford "A".



Chrome Nickel set the standard for automotive castings with its added strength, elimination of flaws and its rust resisting properties. Makes Chevrolet valve seats last longer, too. WOHLERT pioneered Chrome Nickel parts, still makes 'em better.

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...What do they mean?
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PROPERLY mated and lapped drive and pinion gears are produced only by thorough and conscientious manufacturing processes. There's no magic wand the shop foreman can wave and pronounce a gear set "mated and lapped."

MATING is a matter of selecting—by running together under actual service load on Gleason Testing Machines—a drive gear and a pinion whose teeth have proper contact for lapping.

LAPPING—on Gleason Lapping Machines—is an operation whereby these important results are obtained: **1** Elimination of tool and cutter marks on face of teeth. **2** Elimination of irregularities in tooth contour resulting from heat-treat distortion, and **3** Assurance of a uniform and ideal tooth contact which makes for quick and quiet installation and long-lived service.

These operations are essential to the production of good gears—for no one yet has discovered a method whereby distortion under heat treatment can be absolutely eliminated. Nor has anyone yet found a means of cutting steel with any type of cutter, without leaving tool and cutter marks.

Double Diamond Gears are accurately mated and lapped, and the correct setting for the pinion is marked on the Double Diamond mating tag. But more than this, every Double Diamond gear set is built to finest original equipment standards— not less than 3½% nickel steel in both drive gear and pinion—upset forgings—copper plated blanks.

You can depend on quick, quiet installations with Double Diamond Gears. You can depend also on long-lived, satisfactory service. Double Diamond Gears are sold at list prices the same as those of car manufacturers by a nation-wide system of warehouses, assisting more than 700 jobbers to give you prompt service.

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Double Diamond

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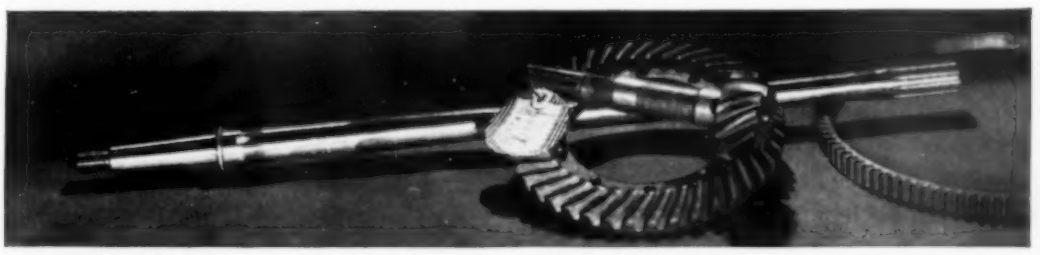

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Stop babying your trucks

Du Pont spent years developing Automotive DULUX so that you can achieve a new high in truck appearance and establish a new low for upkeep costs

A TRUCK FINISH must stand the gaff or refinishing costs pile up quickly. The trouble has been that many finishes have not stood up. Owners have had to baby their trucks with frequent trips to the refinisher's.

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Sample of specifications for Refinishing Trucks prepared for Kroger Grocery & Baking Company, Cincinnati, Ohio. Let du Pont draw them up for your fleet.

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